ILLINOIS

October, 1950

Prevention of Respiratory Infections in Children

Experiences with Neoplastic Diseases of the Thyroid Gland

Laboratory Diagnosis of Virus Infections

(See page 5 for Table of Contents)

BANTHĪNE*

BROMIDE

BRAND OF METHANTHELINE BROMIDE

Treatment individualized to patient.

One or two tablets (50 or 100 mg.) every six hours, around the clock, in peptic ulcer management.

THE NEUROGENIC APPROACH— A MAJOR ADVANCE IN ULCER THERAPY

BANTHĪNE is not an alkali. It is a true anticholinergic drug which, through its inhibition of excess vagal stimulation, controls hypermotility consistently, reduces hyperacidity in most instances and relieves ulcer pain promptly.

The clinical success of BANTHĪNE has been demonstrated by roentgenographic and gastroscopic evidence of healing as well as by laboratory and symptomatic evidence of improvement.

**Trademark of G. D. Searle & Co., Chicago 80, Illinois*

SEARLE

RESEARCH IN THE SERVICE OF MEDICINE

Entered as Second-Class Matter July 21, 1919, at the Post Office, Oak Park, Illinois, under the Act of March 8, 1879. Acceptance for mailing at special rate of postage provided for in section 1102, Act of October 8, 1917, authorized July 15, 1918. Office of Publications, 715 Lake Street, Oak Park, Ill.

The ILLINOIS Medical Journal

Official Journal of the Illinois State Medical Society

Harold M. Camp, EDITOR. Theodore R. Van Dellen, ASSOCIATE EDITOR.

EDITORIAL BOARD — James H. Hutton, Chairman, Frederick H. Falls, Josiah J. Moore, Edwin M. Miller, Chauncey C. Maher, Harry Culver, Walter Stevenson, Raymond W. McNealy, Arkell M. Vaughn, Edwin F. Hirsch.

Vol. 98, No. 4 October, 1950

TREATMENT PLUS

A rehabilitated patient is the objective of successful treatment. This concept is gaining momentum today and, as a result, rehabilitation has become an important phase of physical medicine. Medical care is not complete until the disabled person is trained to live and work with what he has left.

It is customary for many physicians to remind their heart patients to avoid respiratory infections and not to over-exert. This is the extent of their advice. But the question as to what can be done without jeopardizing his heart condition is neglected. In addition, there must be many short cuts that allow individuals more leeway in order to enjoy an existence that approaches normal. This brings us into the field of rehabilitation.

The American Heart Association, for example, has a pamphlet entitled "The Heart of the Home" in which many of the experience of cardiologists and heart patients have been pooled to make it easier to work about the house. There is a plan for a model kitchen which permits cooking and dishwashing with the least amount of effort. By sitting in one spot, the heart patient is able to prepare an entire meal without too much wear and tear on the "old ticker." This is practical advice and there is no reason why it cannot be carried out into other fields provided physicians and patients are willing to analyze the problem.

The Institute of Physical Medicine and Rehabilitation of New York University has compiled a manual of self-help devices for rehabilitation. It contains suggestions that will help the spastic and the paraplegic to become more self-sufficient. A small metal cuff, for eaxmple, can be made to fit over the hand of a handicapped individual to hold eating utensils, toothbrush, comb, etc. This gadget can be made from scrap material and is of estimable value for those who do not have sufficient power to grasp a small handle. This means the difference between feeding oneself or having to be fed by a nurse or member of the family. It is simple, yet how often do we recommend that such devices be utilized?

Many other similar gadgets are described including a rack for holding playing cards, a telephone holder, a training cup that cannot spill, and a description of how to lengthen a shoe horn with aluminum tubing in order to help a patient who cannot bend over to put on the shoes. Furthermore, the shores are equipped with zippers and a small hook can also be attached to grasp the handle of the zipper.

Rehabilitation extends into many fields. The diabetic finds he is denied work because of his condition. But this need not occur especially

with the diabetic who knows how to take care of himself. Since the physician knows his patients, he should go out of his way to help the individual who is cooperative because such a person can work without endangering his or the life of others.

DERMATOLOGY TODAY AND TOMORROW

Many believe that dermatology is in need of a transfusion. It is argued that specialists in this field often confine their consultation to examining the skin and writing a prescription for a stimulating or soothing ointment. These remedies often are empirical because the cause is not known. The situation is bound to change in the future and we predict that the dermatologist will become more versed in internal medicine. He will consider rashes and other types of skin lesions to be outward manifestations of internal disturbances. This is reasonable inasmuch as each year more and more neratological conditions are added to the field of internal medicine. The collagen disorders fall into this category particularly with lupus erythematosus and dermatomyositis. Boeck's sarcoid is another example, and every day we hear more and more of the relationship between psoriasis and rheumatoid arthritis. Allergy and psychosomatic medicine already have made sizable dents into this field. No doubt in the future more internists will take up dermatology or, better, more dermatologis's will delve into internal medicine.

THE CONTROL OF TUBERCULOSIS

Considerable a'tention has recently been given to BCG vaccination in the public press. From this publicity the impression might be gained that this procedure alone holds promise of real control of tuberculosis. Since such an impression might postpone indefinitely the establishment and ex'ension of accepted control measures, this statement of the status of vaccination in tuberculosis control programs is issued.

1) Control measures in tuberculosis should be directed at eradication of the disease as a major cause of death or disability.

2) The marked improvement in tuberculosis mortality figures, particularly for the ages under 30, demonstrates the effectiveness of the present control program.

3) The low rate in children and the continuing high rates in adults over 50 emphasize the loca ion of the problem at the older age levels rather than in children. Under these circumstances, the efficiency of a method of tuberculosis control would be measured by its effect on the mortality from tuberculosis in the older age group, rather than in children.

4) The addition of a vaccine to the present control program requires both careful and adequate consideration. Of the vaccines proposed, BCG has been used most widely and is the one most often discussed.

5) This has been used for more than 25 years and recently many millions of people have been vaccinated. However, it must be stated that there is no evidence that meets strict scientific requirements demonstrating that BCG affects the control of tuberculosis, despite the very suggestive results of a few studies.

6) Because of the above fact and because there is no general agreement among investigators anywhere in the world on such fundamental matters as the preparation of vaccine, the method of vaccination, what constitutes a successful vaccination, how resulting immunity may be measured, how long such immunity lasts, etc., the procedure would seem to be still in the investigational period.

7) It is therefore recommended that investigation of vaccination in tuberculosis be continued and increased under standard and stringently controlled conditions. This investigation should be designed to determine if the vaccine is indeed effective and what the limitations of its use might be. It would seem desirable that in each country, one agency preferably the official health agency, should save control of the investigation.

8) Until this has been determined and until these controlled studies completed, the use of BCG vaccine should be limited to such investigative studies.

9) At the present time the methods which have proved effective in tuberculosis control should be increasingly applied to all segments of the population, regardless of decreasing mortality figures, so long as tuberculosis remains an important cause of death. These measures in-

clude mass x-ray case finding, early diagnosis, rapid institution of treatment, isolation of open cases, and the restoration of the patient to normal life.

Report, Council on the Management and Treatment of Diseases of the Chest, American College of Chest Physicians

A.M.A. INTERIN SESSION IN CLEVELAND

The Fourth Clinical Session of the American Medical Association, designed primarily for the general practitioner, will be held in Cleveland, December 5-8.

The scientific sessions and the scientific and technical exhibits will be presented in the Cleveland Municipal Auditorium. Meetings of the House of Delegates will be held in the Statler Hotel. These sessions of the body elected to govern the affairs of the A.M.A. are attracting more and more non-delegate physicians each year.

Clinical teachers with recognized ability as speakers will headline the scientific demonstrations. Actual cases will be presented and discussed. Diagnoses, treatment and preventive measures as they fit into daily practice will receive the greatest attention.

Each clinical session will be limited to an attendance of 100 physicians. These small groups will make it possible for the general practitioner to enter actively into the discussion and to inquire about his own cases. Leading men in each of the fields under discussion will be available to help with the problems presented.

Once again color television will take its place on the program. A schedule of surgery, clinical treatment and examination will be telecast from the Western Reserve School of Medicine to the auditorium.

The annual General Practitioner Award has come to be regarded as one of medicine's highest honors and a definite step toward increasing the recognition of the family doctor. This year's selection will be made at the Cleveland meeting.

The steadily climbing registration of general practitioners at the clinical sessions and the comments of those participating indicate these meetings are valuable means of keeping abreast of developments in medicine. It is hoped that a record number of physicians will take advantage of the opportunity in December to attend. The program has been designed with that in mind.

RARE TYPE OF CANCER MAY FOLLOW NAIL INJURY

A rare type of cancer arising in the finger or toe nails is reported by a Peoria doctor in the September 2 Journal of the American Medical Association.

Appearance of a sore between the cuticle and the nail is a distinguishing characteristic of this cancer, Dr. Lyle W. Russell says. Symptoms such as swelling and moderate pain easily may lead to delayed recognition of the tumor and confusion with other conditions, he points out.

The cancer may appear as a small, yellowish crater which fails to heal and if neglected may invade the bone, according to Dr. Russell. Amputation of the finger or toe is the recommended treatment and the outlook for cure usually is good unless spread of the cancer to another part of the body has occurred prior to the surgery.

Injury appears to be a possible inciting cause in the formation of this type of cancer, Dr. Russell says. In 11 of 20 cases reported, a deep puncture wound between the nail and nail bed or other injury to this area preceded the diagnosis of cancer by six months to 18 years.

CORRESPONDENCE

"YOUR MENTAL HOSPITALS" TINLEY PARK STATE HOSPITAL

Land has been purchased and construction has been started on a new forty million dollar mental hospital in Illinois. This will be the sixteenth mental institution in this State. The other State Institutions are: 9 — *Mental Hospitals at* Chicago, Elgin, Kankakee, Manteno, East Moline, Peoria, Jacksonville, Alton and Anna. 2 — *Hospitals for the Mentally Defiicient at* Lincoln and Dixon 1 — *Hospital for the Criminally Insane* Illinois Security Hospital at Chester 2 — *Research Institutions* Illinois Neuropsychiatric Institute at Chicago, Galesburg State Research Hospital at Galesburg 1 — *For Child Psychiatry* Institute for Juvenile Research at Chicago.

Over four hundred acres of land was purchased on the southern outskirts of Cook County at 183rd Street and Harlem Avenue in Tinley Park, Illinois. Numerous meetings and conferences have been held with members of the State Welfare Department, the State Architects and other experts throughout the country in the development of plans for a modern institution which would function efficiently, yet retain all the desirable features of pleasant and attractive surroundings with a homelike atmosphere. The firm of Skidmore, Owings and Merrill has been engaged as the Associate Architects for the development of detailed plans.

The institution will care for a maximum of 4,000 patients. It will consist of two complete units; namely, a general psychiatric unit of 2,500 beds for the care and treatment of mental patients, and a self-contained unit for 1,500 mental patients with active pulmonary tuberculosis. The mental cases with tuberculosis will be transferred to Tinley Park from the other northern institutions for better medical care and pulmonary surgery.

The General Psychiatric Unit will consist primarily of one story buildings interconnected by tunnels and underground passageways. A multi-story building five or six stories high, will be constructed to house the acute medical and surgical units, the infirmaries and the special research units. An extensive receiving, diagnostic center and active psychiatric treatment building will provide a miximum benefit of examination and early treatment for the newly admitted patients.

Employees will be housed in quarters varying from single rooms in a multi-story building to small apartments and cottages. Housing will be provided for approximately two-thirds of the six hundred employees.

Construction has been started, and the current 1949-1951 appropriation of two and a quarter

million dollars will provide the basic utilities; namely, the wells, sewer lines, incinerator, sewage treatment plant, railroad sidings and roadways, and the power plant. The total cost of the institution is estimated at forty million dollars. It is hoped that funds will be obtained from the State Legislature to complete this new State Hospital within the next eight to ten years.

CLINICS FOR CRIPPLED CHILDREN FOR NOVEMBER

Doctor Herbert R. Kobes, director of the University of Illinois Division of Services for Crippled Children, has released the November schedule of clinics for physically handicapped children. The Division will conduct 15 general clinics providing diagnostic orthopedic, pediatric, speech and hearing examinations along with medical social and nursing services. There will be 4 special clinics for children with rheumatic fever and 1 for cerebral palsied children.

Clinics are held by the Division in cooperation with local medical and health organizations and groups, hospitals, civic and fraternal clubs, and other interested groups. From private physicians, who are certified Board members, are selected the clinicians. Any private physician may refer or bring to a convenient clinic any child or children for whom he may want examination or may want to receive consultative services:

The November clinics are:

November 1—Joliet, Will Co. TB Sanitarium
November 2—Pittsfield, Illini Community Hospital
November 7—Shelbyville, Veterans Center
November 8—Hinsdale, Hinsdale Sanitarium
November 9—Elmhurst (Rheumatic Fever), Memorial Hospital of DuPage County
November 9—DuQuoin, Marshall Browning pital
November 9—Springfield, St. John's Hospital
November 10—Chicago Heights (Rheumatic Fever), St. James Hospital
November 14—Peoria, St. Francis Hospital
November 14—E. St. Louis, St. Mary's Hospital
November 15—Evergreen Park, Little Company of Mary
November 15—Sterling, Sterling Public Hospital
November 16—Rockford, St. Anthony's Hospital
November 17—Chicago Heights (Rheumatic Fever), St. James Hospital
November 21—Casey, High School
November 28—Peoria, St. Francis Hospital
November 28—Effingham (Rheumatic Fever), St. Anthony's Emergency Hospital
November 29—Springfield, (Cerebral Palsy), Memorial Hospital
November 29—Alton, Alton Memorial Hospital
November 30—Bloomington, St. Joseph's Hospital

In carrying on its program the Division works cooperatively with local medical societies, hospitals, the Illinois Children's Hospital-School, civic and fraternal clubs, visiting nurse associations, local social and welfare agencies, local chapters of the National Foundation for Infantile Paralysis and other interested groups.

The Division of Services for Crippled Children is the official state agency established to provide medical, surgical, corrective and other services and facilities for diagnosis, hospitalization, and after-care for children who are crippled or who are suffering from conditions which may lead to crippling.

RADIOLOGICAL SOCIETY OF NORTH AMERICA

Announcement is made by Warren W. Furey, M.D. of Chicago, president of the Radiological Society of North America, that the 36th Annual Meeting of the Society will be held in Chicago, December 10 through the 15th.

Headquarters for the meeting will be the Palmer House in which all scientific and technical sessions will be held. Scientific exhibits are also to be displayed in the hotel.

More than 60 papers as well as refresher courses feature the convention program.

Dr. Wendel G. Scott of St. Louis, Missouri, will present the annual Carmen Lecture. All members of the medical profession are welcome and invited.

AMERICAN COLLEGE OF CHEST PHYSICIANS PRIZE AWARD

The Board of Regents of the American College of Chest Physicians offers a cash prize award of two hundred and fifty dollars to be given annually for the best original contribution, preferably by a young investigator, on any phase relating to chest disease. The prize is open to contestants of other countries as well as those residing in the United States. The winning contribution will be selected by a board of impartial judges and the award, together with a certificate of merit, will be made at the forthcoming annual meeting of the College to be held in Atlantic City, New Jersey, June 7-10, 1951.

The College reserves the right to invite the winner to present his contribution at the annual meeting and to publish the essay in its official publication, *Diseases Of The Chest*. Contestants are advised to study the format of *Diseases Of The Chest* as to the length, form and arrangement of illustrations to guide them in the preparation of the manuscript.

The following conditions must be observed:
1. Five copies of the manuscript, typewritten in English should be submitted to the executive Office of the College, 500 North Dearborn Street, Chicago 10, Illinois not later than April 1, 1951.
2. The only means of indentification of the author or authors shall be a motto or other device on the title page and a sealed envelope, bearing the same motto or device on the outside, enclosing the name of the author or authors.

ANNOUNCEMENT OF VAN METER PRIZE AWARD

The American Goiter Association again offers the Van Meter Prize Award of three hundred dollars and two honorable mentions for the best essays submitted concerning original work on problems related to the thyroid gland. The Award will be made at the annual meeting of the Association which will be held in Columbus, Ohio, May 24, 25 and 26, 1951, providing essays of sufficient merit are presented in competition.

The competing essays may cover either clinical or research investigations; should not exceed three thousand words in length; must be presented in English; and a typewritten double spaced copy in duplicate sent to the Corresponding Secretary, Dr. George C. Shivers, 100 East Saint Vrain Street, Colorado Springs, Colorado, not later than March 1, 1951. The committee who will review the manuscripts is composed of men well qualified to judge the merits of the competing essays.

AUTHORIZE APPOINTMENT OF WOMEN DOCTORS AS RESERVE CORPS OFFICERS

Appointment and concurrent assignment to active duty as Reserve Officers of women physicians, dentists, and allied specialists, has been authorized, according to the Department of the Army.

This marks the first time authorization has been given for women to be commissioned in the Medical, Dental, Veterinary, and Medical Service Corps Reserves. They will be brought on duty under regulations currently providing for the commissioning of male officers in these Corps. Some women did serve in the Army as physicians and technicians during World War II, but their commissions have expired.

As Reserve officers on active duty, these women will be given opportunities for clinical practice and advancement which are now available to male officers in comparable grades, Major General R. W. Bliss, Surgeon General of the Army, pointed out. Appointments will be in grades from first lieutenant to colonel, depending upon age, experience, and professional qualifications. The pay, allowances, dependency and retirement benefits which accrue to male officers will apply to the women medical reservists. Women physicians and dentists will also draw the $100 a month professional pay allowed above the base pay of their commissioned rank. They will be eligible for service in every type of military medical facility, with the exception of forward medical installations in combat zones.

SECTIONAL MEETING OF AMERICAN COLLEGE OF SURGEONS

There will be a Sectional Meeting of the American College of Surgeons in St. Louis on January 22 and 23, 1951, and we would appreciate it very much if you would run an announcement of it in your state journal for the ensuing issues or in as many as you deem proper.

As you know, the members of the College of Surgeons are invited and also any other doctors who wish to attend. I think there will be a reg-

istration fee of $5.00 for non-members but, as this is the first year this has been done, I am as yet not sure about it.

The states covered are Missouri, South Dakota, North Dakota, Minnesota, Wisconsin, Iowa, Kansas, Louisiana, Arkansas, Mississippi, Illinois and Indiana, and an excellent and practical program has been arranged. There will be an extra day of operative clinics besides the scheduled days.

The meeting is on January 22 and 23, 1951, with headquarters and the program at Hotel Statler.

James Barrett Brown, M.D.
Chairman, Sectional Meeting
American College of Surgeons
St. Louis, Missouri, Hotel Statler

AMERICAN COLLEGE OF PHYSICIANS TO MEET IN MADISON

The Midwest Regional Meeting of the American College of Physicians will be held at the Memorial Union Theater on the campus of the University of Wisconsin in Madison, Wisconsin, Saturday, November 18, 1950. Registration will begin at 8:00 A.M. and the scientific meetings will be followed by a social hour and dinner to be held at the Loraine Hotel in Madison, beginning at 5:30 P.M. The day will be filled by the presentation of scientific papers. In addition, a scientific exhibit will be provided in the foyer of the Memorial Union Theater.

Entertainment has been planned for the ladies, including a tea on Saturday afternoon at which Mrs. Oscar Rennebohm, wife of the Governor of Wisconsin, will be hostess. Tea will be served in the Governor's Mansion on the shores of Lake Mendota.

It must be emphasized that this meeting is open to all physicians whether or not they are members of the American College of Physicians. All physicians and their wives are cordially invited to be present and to participate.

Reservations for luncheon and dinner should be made immediately through Dr. H. M. Coon, 1300 University Avenue, Madison 6, Wisconsin.

INTRA-EPITHELIAL CARCINOMA OF THE CERVIX

There are many reasons why total hysterectomy is the treatment of choice for intra-epithelial malignancy. The most conclusive reason is that in all cases that have been observed for an appreciable period there have been no recurrences of the disease following complete removal of the uterus. The largest group of such patients observed for a period of time is probably that of Galvin and Telinde. They have a series of sixty-seven cases where the uterus was removed for noninvasive carcinoma that have been observed for a period of from six months to eight years without any evidence of recurrence. Since the average age of the patients who develop intra-epithelial carcinoma is over thirty-five, the majority of these women are near the end of their reproductive period; therefore, preservation of the uterus for pregnancy is unimportant. By complete hysterectomy there is assured removal of all cervical epithelium as well as the removal of pathologic pelvic conditions which have been recognized or have been unrecognized preoperatively. It is of some importance to remove a small cuff of vaginal mucosa surrounding the cervix to be certain that no malignant tissue remains. In performing hysterectomy for this condition, one may leave one or both ovaries in younger women because it has been observed that the ovary is not a site of early metastasis of cervical carcinoma. That the remaining ovary may be a source of carcinogenic estrogen is of no real concern since it has never been proved that estrogen has any effect on the development or growth of cervical carcinoma. *Except: Intra-Epithelial Carcinoma of the Cervix, David A. Bickel, M.D., and Carl S Culbertson, M.D., South Bend, The Journal of the Indiana State Medical Association, April 1950.*

ORIGINAL ARTICLES

The Prevention of Respiratory Infections in Children, Including Sulfonamide Prophylaxis

J. Keller Mack, M.D.
Springfield

The most common complaint among children in this climate during the winter is that of repeated colds, sore throats, and coughs. The mother brings the child of from three to nine years to the office, and is worried because he has been having repeated respiratory infections. The child does not eat well and often has lost weight. He does not have as much "pep" as usual and appears generally run-down. In addition, he may have a runny nose and his cough may alarm other patients in the waiting room, who think he has pneumonia or whooping cough.

Even though repeated respiratory infections do not usually impair the child's growth or development, the problem is nevertheless an important one. These infections are the most frequent cause of illness in children. They cause a great deal of disability, loss of time from school, and medical expense. Acute complications are frequent and sometimes serious. Frequent and repeated infections are often the cause of anorexia, malnutrition, and secondary hypochromic anemia. Chronic suppurative sinusitis, otitis media and bronchitis occur frequently enough to be a real danger. Therefore, when a child presents himself because of repeated infections, we should not shrug our shoulders and tell the mother to forget about it—that the child will outgrow it.

Because of our lack of knowledge concerning viruses, a limitation of the discussion must be interposed here. Since we have no vaccines (except against influenza) or drugs which are effective against respiratory viruses, the only thing we can do in the prevention of virus infections

Presented before the Section on Pediatrics, 109th Annual Meeting, Illinois State Medical Society, Chicago, May 17, 1949.

is to put our patient into the best possible physical condition and keep his environment as healthful as possible. Therefore, this discussion will not deal with the "common cold", but only with its complications or with respiratory infections which are of bacterial etiology. The actual incidence of viral etiology of respiratory infections has not been determined. Recently it has become fashionable to attribute a majority of respiratory infections to viruses. It is not within the scope of this paper to review the literature on this subject. When one has done so he is still at a loss because of conflicting evidence due to lack of laboratory methods of identifying viruses. Practical clinical experience shows that during most of the year respiratory infections respond dramatically to chemotherapy or antibiotics, while at others, viruses or resistant bacterial strains seem to play a prominent role. For example, the latter ones have been rather frequent during March and April of this year. (1949) However, even if we eliminate viruses there are still a great many respiratory infections in children which we can help to prevent.

It is well known that children are more susceptible to respiratory infections than are adults, which indicates that this problem is primarily one of lack of immunity to the causative organisms. By repeated exposure to infections the child, over a period of years, gradually builds up an immunity. Time does not permit a detailed discussion of this opinion, but it is generally accepted as far as the bacterial (not virus) infections are concerned. Therefore, the logical solution would be to do something to help the child build up his immunity more rapidly. The only direct approach which has been suggested is the administration of respiratory vaccines, the results of which have been very disappointing. The difficulty probably arises from the fact that there are so many different strains of streptococci, pneumococci, etc., each of which is immunologically more or less distinct from the others. The problem is further complicated by the fact that immunity to the respiratory organisms is very difficult to measure in the laboratory, thus making research along these lines rather unproductive. Therefore, an effective respiratory vaccine has not been developed. Consequently, in our present lack of knowledge concerning this subject we must turn to other less direct methods of solving our problem.

In the prevention of repeated respiratory infections there is no general rule to follow. Each patient must be evaluated as an individual problem. First, it must be decided whether or not the patient under consideration really does have too many infections of more than average severity. Practically all children have some respiratory infections every winter, and one must not be unduly influenced by an over-anxious mother. The duration of infections and the occurrence of frequent complications are more important than the number of episodes during a winter season. A thorough history, a careful physical examination, followed by such laboratory work as may be indicated, are, of course, essential.

If a dietary or vitamin deficiency is found, attempts should be made to correct it. Proper hygiene should be explained to the mother. In this connection the most common fault is the overheating of homes, with the production of air that is so dry that it injures the membranes of the repiratory tract.

It is not the purpose of this paper to discuss at any length the tonsil and adenoid problem. However, since chronic infection in these lymphoid structures is a common cause of repeated respiratory symptoms, the problem must be mentioned for the sake of completeness. The most important point to remember is that each patient must be individually evaluated. When chronically infected, the removal of tonsils and adenoids may give excellent results, but it cannot be said too often that the presence of repeated respiratory symptoms alone is not an indication for removal. Many of the children that come to us complaining of frequent infections have already had these structures removed. Because pharyngeal lymphoid tissue serves a useful purpose, especially in young children under the age of 6 years, indiscriminate surgery in this age group should be condemned. Where symptoms of obstructed breathing or frequent otitis media are present in young children, it is usually advisable to remove only the adenoids.

The indications for tonsillectomy and adenoidectomy may be summarized as follows: The history is probably more important than the physical examination. The history should reveal repeated attacks of tonsillitis or sore throat, symptoms of adenoid obstruction, or repeated otitis media.

Repeated respiratory infections of a general nature may be used as an indication for a tonsillectomy in an older child with the reservation that results may be disappointing. Concerning the physical examination, it has been repeatedly stated that enlarged tonsils do not necessarily need to be removed, even in older children. The appearance of the tonsils is very misleading. Persistent enlargement of the cervical glands is more important, probably indicates some absorption of toxic products, and may be used as an indication for tonsillectomy. Removal of tonsils and adenoids for purely allergic conditions is contraindicated.

We come then, in the evaluation of our child with repeated respiratory infections, to the point at which we have done everything possible to improve the nutrition and hygiene, and the tonsils and adenoids have been removed if indicated. What can then be done for a child who continues to have repeated respiratory infections? As previously stated, there is very little we can do to raise the child's natural immunity. However, I believe that there is a useful therapeutic procedure now at our command, which can bring about good results in selected cases and with proper care and observation. I refer to the prophylactic daily administration of sulfonamides during the so-called "respiratory season".

The value of sulfonamide or antibiotic prophylaxis of respiratory infections in children with rheumatic or certain types of congenital heart disease is now widely accepted.[1-12] Several large clinics have performed experiments in prophylaxis, using daily doses of oral penicillin.[13, 14] The cost of oral penicillin to private patients is practically prohibitive when used over a long period of time. Since sulfonamides are apparently as effective as penicillin and no more dangerous in the doses given, it was decided that sulfonamides should be used in the experiment to be described.

Much has been written about the large scale experiments carried out by both the Army and Navy during the war, on prophylactic use of sulfonamides in training camps. Without going into details, it is the concensus of opinion that this prophylaxis did reduce the incidence of streptococcic infections, rheumatic fever, meningococcic infections and other respiratory infections not of virus etiology. However, it must be stated that in these camps during the experiments there frequently developed strains of organisms which were resistant to sulfonamide drugs.[15, 16] This is thought to be due to an elimination of sulfonamide sensitive organisms and a consequent increase in the percentage of respiratory infections caused by resistant organisms in those camps. However, one consideration must be kept in mind in this connection. These Service experiments were carried out in camps in which all or a large part of the population was given prophylaxis and thus the sensitive organisms were almost completely eliminated from the environment. This consideration is not valid in a civilian community in which only a very small percentage of children would be taking daily sulfonamides. Adults and other children would continue to harbor sulfonamide sensitive organisms and these would continue to be the predominating organisms causing respiratory infections. A point in favor of this belief is that the large majority of acute respiratory infections in children respond promptly to treatment with sulfonamides. In addition, the crowding and congestion in barracks, mess halls, etc. of the service camps do not prevail in civilian communities. Therefore, since it has been pretty well established that respiratory infections due to sensitive organisms are greatly reduced, it follows that the child receiving sulfonamide prophylaxis would be protected against most of the respiratory infections. I believe that the above reasoning is valid, and therefore, that prophylaxis in selected cases should give better results than was obtained in the Army experiments.

Since the administration of sulfonamides is not without a certain risk, the question arises as to whether or not the procedure is warranted for the amount of good to be obtained, in other words, is this too big a gun to be wheeled out in such a battle? The answer to this question must be considered from two standpoints: First, the magnitude of the battle—it has been shown above that in young children repeated respiratory infections can be a great cause of disability with its consequent possibility of permanent damage. In the second place, is the use of sulfonamides too dangerous when given over a long period of time? Referring back to the Army and Navy studies, and also to studies among rheumatic children, it can be definitely stated that the oc-

currence of reactions to the small doses used is almost negligible. Very large numbers of patients have been involved in the experiments with a very low incidence of reaction. It is now pretty well established that rare reactions to small doses are usually due to an individual hypersensitivity to the drug. Sulfonamide reactions may manifest themselves as rashes, fever, hematuria, hemolytic anemia and granulocytopenia. If the patient is cooperative, and the proper precautions observed, as mentioned below, any real damage from such sensitivity can practically be eliminated.

During the past three winter seasons, 54 children were placed on daily sulfonamides for the prevention of respiratory infections. Their ages ranged from 2 to 15 years. Five of these were rheumatic fever patients, 6 were allergic (mostly asthma), others were normal children who were subject to respiratory infection and in whom no further local treatment was necessary. They have also been given an adequate diet, hygiene had been discussed, and added vitamins have been administered. The program for the administration of the sulfonamides has been as follows: The daily dosage has varied from 5 grs. in the child of 2 to 3 years, 7½ grs. from 4 to 7 years, 10 grs. from 8 to 10 years, and 15 grs. in the older children. Sulfamerazine is the drug of choice, administered either in liquid or tablet form. The daily dose is divided into two parts, one being given before breakfast and the other in the evening.

Blood counts have been done on the average of every two weeks for the first six weeks, since it has been shown that reactions which occur are most likely to come on at the beginning of treatment. After the first six weeks the children are seen for blood counts at about once a month. Urinalysis is also done periodically. Mothers were requested to report the occurrence of any unusual symptoms such as rash, vomiting, urinary symptoms, malaise, etc. Only patients and parents who were considered to be cooperative and intelligent were placed on such a regime. I do not believe it would be wise to institute this treatment unless you could be fairly sure that the patient would return for observation.

The 54 children who were given prophylactic sulfonamide therapy had had an average of 4 to 5 respiratory infections during the previous winter, not counting "common colds", with the exception of two of the rheumatic children, in whom the treatment was given to prevent infections which might cause a recurrence of rheumatic fever. Seven of the children were given the regime for two years. In the case of the asthmatic patients, it was felt that some of the attacks were initiated or accompanied by respiratory infections since they often had fever with attacks. The previous infections complained of were of all types, such as: colds, coughs, sinus infections, pharyngitis, tonsillitis, pneumonia, bronchitis, otitis media. It must be emphasized that these were the worst cases, selected only when the chief complaint was repeated infections with fever, and when it was felt that the parents would be cooperative.

After the institution of sulfonamide prophylaxis, the virtual absence of significant infections was spectacular. These children, who had previously been seen repeatedly by the author or other doctors, and who, according to their histories, had had an average of 4 or 5 febrile infections in a winter, would have been expected to experience a total of from 100 (about 2 per child) to 200 (4 per child) infections for the whole group. Instead of this incidence, there were only 14 instances of respiratory infection in the total series—and no child had more than one infection per season while on prophylactic treatment. These 14 instances required only a total of six office or house visits for infections. With two exceptions, these infections were all a mild involvement of the throat, ear or bronchus with temperatures not over 100 degrees. These two exceptions were cases of bronchitis which occurred during periods of widespread prevalence of virus infections, and which were probably of this etiology. One occurred in a rheumatic fever patient who was in the hospital at the time. The maximum temperature was 101 degrees and the infection was of short duration. The second had a maximum temperature of 102 degrees at a time when there was a virtual epidemic of virus pneumonia and bronchitis. The asthmatic children did require occasional office visits or house calls for asthma, but no attacks were associated with fever. In all the other children, mothers reported occasional mild cough or "common colds" which ran the usual course for several days without complications and required no visits. During these seasons there was a severe measles epidemic (1 patient had a mild earache) and 2 widepread

epidemics of virus pneumonia and bronchitis. These children not only fared better than they had previously but had fewer infections than their brothers or sisters and fewer infections than most normal children of their age.

Not included in the above figures is the case of a child in whom the regimen must be regarded as probably a complete failure. This boy of 18 months had had recurrent bronchitis of an asthmatic type since the age of 9 months. The cause of these recurrences could not be determined. No really allergic basis could be found, no congenital malformation demonstrated, and examination for pancreatic fibrosis was negative. Sulfonamide prophylaxis failed to prevent recurrences, but penicillin would usually give fairly prompt relief.

The mothers of all patients were pleased with the results of the treatment, but 4 of them stopped treatment of their own accord because they thought the child no longer needed it.

There was only one reaction to the sulfonamides but this child had to discontinue medication because of what was thought to be a reaction to the drug. This case is of interest because of the unusual nature of the reaction which was not an abnormality of the blood count or urine. The patient, a girl of 2 years, had had almost constant attacks of colds and coughs. She was well nourished and there was no evidence of cystic fibrosis of the pancreas. She was given sulfamerazine, 2½ grs. twice a day. After one month she suddenly developed fever with which there were no findings except an elevated leucocyte count with an essentially normal differential. The sulfamerazine was stopped and the temperature returned to normal. After several days the medication was restarted and one month later the same process was repeated. At the mother's request, the sulfamerazine was tried again but the same symptoms recurred after a month of medication. The child completely recovered each time with no ill effects. During this time the patient had no significant respiratory infections.

I would be the first to admit that this series is too small to furnish figures which would be valuable from a statistical point of view, but the results are so striking that it is hoped that further interest in the method will be stimulated.

CONCLUSIONS

Respiratory infections can best be prevented, according to our present knowledge, by the following procedures:

1. Improvement of general hygiene, diet, living conditions.
2. Local treatment of pathology in the respiratory tract, after thorough study and conservative evaluation.
3. Daily administration of small doses of sulfonamide drugs from November through April, in selected cases.

REFERENCES

1. Thomas, C. B., and France, R.: Bull. Johns Hopkins Hosp. **64**: 67, 1939.
2. Coburn, A. F., and Moore, L. V.: J. Clin. Investigation **18**: 147, 1939.
3. Coburn, A. F., and Moore, L. V.: M. Clin. North America **24**: 633, 1940.
4. Stowell, D. D., and Button, W. H.: J. A. M. A. **117**: 2161, 1941.
5. Thomas, C. B., France, R., and Reichsman, F.: J. A. M. A. **116**: 551, 1941.
6. Thomas, C. B.: Bull. New York Acad. Med. **18**: 508, 1942.
7. Hansen, A. E., Platou, R. V., and Dwan, P. F.: Am. J. Dis. Child. **64**: 963, 1942.
8. Kuttner, A., and Reyersbach, G.: J. Clin. Investigation **22**: 77, 1943.
9. Chandler, C. A., and Taussig, H. B.: Bull. Johns Hopkins Hosp. **72**: 42, 1943.
10. Dodge, K. G., Baldwin, J. S., and Weber, M. W.: J. Pediat. **24**: 483, 1944.
11. Baldwin, J. S.: J. Pediat. **30**: 284, 1947.
12. Markowitz, M., and Kuttner, A. G.: J. Pediat. **31**: 195, 1947.
13. Lopin, J. H.: Arch. Pediat. **64**: 121, 1947.
14. Lopin, J. H.: J. Pediat. **32**: 119, 1948.
15. Epidemiology Unit No. 22: J. A. M. A. **129**: 921, 1945.
16. Damrosch, D. S.: J. A. M. A. **130**: 124, 1946.
17. Rosenberg, E. F., and Hench, P. S.: Med. Clin. N. A. **30**: 489, 1946 (May).

DISCUSSION

Dr. Eugene T. McEnery: Dr. Mack emphasizes the point of hygiene and also brings up the fact of crowding. In the Chicago area, every once in a while we get a family that seemingly has one cold after another and you can stand on your head and give them this or that and they still have these colds.

The crowding factor certainly is important because in this family that I mentioned, I made a house call there and looked the situation over. There was a four-room apartment and in that four-room apartment six adults and two children were living. Well, the bathroom facilities for that number of patients were just terrifically inadequate to take care of any hygiene. That was the answer, as far as I was concerned, as to why the children had so many colds and coughs one right after another. The reason for it was because of crowding and because of inadequate bathroom facilities.

Dr. Cline is tremendously interested in allergy. Dr. Mack brought up the subject of allergy, and I think we would like to hear a few words about Dr. Cline's reaction to respiratory infections in reference to that.

Dr. Gerald M. Cline (Bloomington, Illinois): I have been interested in this subject for a number of years and each winter I have had a fair number of children on small dosages of a sulfa drug as a preventative of

upper respiratory infections. At first I was very enthusiastic about the results as a prophylaxis as well as most of us were about the results of treatment of active and severe upper respiratory diseases and their complications with the sulfa drugs. However, today and especially this last winter I, too, found sulfa prophylaxis and sulfa therapy alone quite unsatisfactory. In other words it took a combination of sulfa drugs with penicillin and at times streptomycin, aureomycin, etc. to control what seemed clinically to be the same type of infection we were dealing with three to five years ago. Either the bacterial flora has changed or a combination of resistant organisms has developed.

Will you all agree that this year we had more otitis media and nephritis as complications than we have seen for several years? The winter of 1946 produced a high percentage of pneumonias, 1947 very few pneumonias but many cases of diarrhoea; 1948 more pneumonias, very little diarrhoea but, as stated above, more otitis and nephritis.

We have not attempted to accurately check on the number taking the drug with evaluation of results, but off hand I quite well remember several families and parents so pleased with using sulfa as a prophylaxis one year that they will return each year and ask for a continuation of the drug. I can think of no one who has bitterly opposed its usage. Mainly because of the wide spread publicity in the literature concerning the dangers of producing patient resistance and organism resistance, I have used sulfa far less this past winter than in the winters mentioned before. There was a time when I had at least 75 private patients on a sulfa drug all winter long as a prophylaxis for upper respiratory infection. I know I used larger dosages than most anyone else. Not one time did I encounter any serious complications from the drug. I still have at least a dozen rheumatic children on the year-round small dosage schedule. Here again, in my hands, I feel this management has been quite successful. Therefore, personally I will go along with Doctor Mack and his ideas presented here at least until I am further convinced it is wrong.

Allergy and its part in the causation of frequent upper respiratory infections is no longer debatable. Certainly allergic children have more upper respiratory infections yet, in my opinion, the correction of the allergy alone which is most difficult because of the large number of dust sensitive cases will not compare in results with allergy and sulfa prophylaxis management. in my mind, the dusty feather pillow is our number one gangster always to be removed where one has a cold susceptibility; in fact, I will go along stating that no one should spend one-third of his life with his nose burried in the dirtiest article in the house. Today with commercially made dust proof encasings and, even better, rubber foam pillows, no cold susceptible child should be deprived of these encasings or pillows. I can assure you the results universally would be astounding. The child with ragweed hay fever and/or asthma is often more susceptible to colds and he, too, with the addition of carefully controlled hypo-sensitization to these allergens plus small doses of sulfa will have less colds during the winter. Again this is my personal opinion, which, I believe, agrees with Doctor Mack's ideas.

Anti-histamines also have in some cases reduced the number of colds in some children so until we find the universal method of prophylaxis and treatment of the common cold, there will be variable opinions as to this viewpoint.

Dr. A. R. Eveloff: I would like to emphasize the frequency with which allergy plays a part in a relatively large proportion of children with a history of persistent colds. In this group of patients one finds that the nose is apparently never normal, though there are periods when nasal symptons are more severe than others. If seen in the former period one is likely to find the nose to present a picture of allergic rhinitis, with abnormal numbers of eosinophils present in the nasal smear. In the latter period the nasal findings are those of an acute rhinitis. This group of children will have many fewer episodes of respiratory infection, if efforts are made to manage the allergy.

I should like to ask Dr. Mack if he thinks one need be concerned about the likelihood of making these children more resistant to subsequent therapeutic use of the antibiotics, after the use of small doses of the drugs in prophylaxis.

Dr. J. Keller Mack (Springfield, Illinois):[2] I, too, am very much interested in allergy. The patients that I considered allergic rhinitis because of history, physical exam or eosinophiles in the nose were not included in this report.

About the question of sulfonamides and what happens to the patient's immunity — theoretically, it could be bad from this standpoint: You could block this child from having infections and therefore block his building up his immunity. That is theroretically probable. If a child doesn't harbor any of these organisms, just as some children become immune to diphtheria by small doses of exposure, probably he may not build up immunity. I wondered about that. I couldn't find anything in the literature about it. My experience, which may be interpreted in various ways, is that after these children were on prophylaxis for 1-2 years their frequent respiratory infections did not recur the following winter. Whether they were more resistant or they had grown out of that phase, I don't know, but it didn't interfere with their immunity.

I think most people agree that sulfa doesn't affect the individual unless he is sensitive to it. It affects the organism only. On a small dose the patient presumably could develop a resistant strain. These children, after taking sulfa for a month, ought to relapse. They didn't. I think a small dose of sulfa will kill off a sulfa-sensitive organism. A virus or a sulfa-resistant organism will not be affected. That is as far as I have been able to get into the theoretical phases of it.

Dr. Eugene T. McEnery: I was glad to hear the way Dr. Mack handled the tonsil and adenoid situation because that always comes up, and his reaction is about the same as mine where he doesn't advocate it until the child is up around five, six or seven years. He said the

main trouble was in the adenoids. I don't know whether or not he is using x-ray treatment on his group of children to see whether they benefit, as far as respiratory infections, by the use of x-ray treatment to diminish or shrink down the adenoid or lymphatic tissue.

Dr. J. Keller Mack: That was a problem that I should have mentioned for completeness but I didn't want to go into it since I think it is a pretty sizable problem. It certainly works in some cases, as proven at Johns Hopkins Hospital, where there is a regrowth of adenoid tissue, causing blockage of the eustachian tube. These children who grow back lymphoid tissue very quickly after an adenoidectomy probably are the lymphoid type, if you want to call it that, and are going to have a regrowth of that lymphoid tissue probably as a means of protection to filter out bacteria.

Dr. Eugene T. McEnery: You can always throw in a plug for various industrial apparatuses on various respiratory infections. The other day a mother said to me — she had a large family of five children — she said, "You know, this year we have had very little occasion to call you. We have had very few colds." I said, "What is that due to?" She said, "You know, I was thinking about it. I wonder if this is the explanation: In the fall of the year we were fortunate in getting a dishwasher. With the use of the dishwasher, we really have not had many respiratory infections."

I began to think about that. Now that wasn't such a bad observation because when you see the way these dishwashers work and the heat of the water they generate there and how they wash the dishes, they certainly remove all bacteria on the dishes. It will be interesting to watch this over a period of years to see if it works out, and it may be a tip to you to see if it works out in your private practice because dishwashers are being used, since the old-time maid situation seems to be settled. There is no such animal.

I have enjoyed this paper and discussion very much. Is there any other discussion?

Member: At the Illinois Children's Hospital, we are caring for about ninety children with very severe orthopedic handicaps, and there is a practical recurrent bronchitis in the children who are under our care, so we have been using prophylactic doses of alphamin on muscular disuse atrophy and polio of the thorax and on a case of hypophonia for several years and we have found that we have had a very marked decrease in infections of this type. I would like to ask Dr. Mack whether he has had any experience with alphamin as a prophylactic agent.

Dr. J. Keller Mack: I think the institutional use of these drugs is not as good as when scattered around in the community because when you get into an institution, you are duplicating the army experience in which organisms develop resistance. But if you use them on selected cases, which you probably do, then I think you will get good results. I thought of using triple sulfonamides and decided that it wouldn't be quite as good as sulfamerazine because, for a small dose, I believe you get a more prolonged level with the latter. I always use triple sulfa for treatment.

ANTICOAGULANT THERAPY

The expense of performing a prothrombin test every day minimizes the economic advantage of Dicumarol, but, when a patient who has been receiving Dicumarol has been under observation for a time, it is frequently possible to lengthen the intervals between tests to as much as one week. However, extending the interval to more than 48 hours should not be attempted unless the physician has had extensive experience with the drug. It is evident that use of such a drug requires painstaking and meticulous observation of the patient and of the laboratory findings during the entire period of anticoagulant therapy. *Excerpt: The Administration of Anticoagulants,* Charles D. Marple, M.D., San Francisco, Calif. *Med., Aug., 1950.*

Experiences with Neoplastic Diseases of the Thyroid Gland

E. P. Coleman, M.D., and D. A. Bennett, M.D.
Canton

There has been an increased awareness of the possibility of cancer in the thyroid gland, particularly following the work done by Cole, Slaughter, and Rossiter who have emphasized the incidence of malignancies in non-toxic nodular goiters, which in their series was over 17%. A careful appraisal of this material from both the clinical and pathological standpoint has been in the making for the past few years.

In the past, thyroid cancer has been recorded as being present in from 2 to 4% of the cases, but more recently it has been found that in toxic diffuse goiter, the incidence is less than 1% while in non-toxic adenomas it varies from 12 to 17%, and in solitary adenomas, especially in the young, it may rise to as high as 25%.

Our attention was called to this rather recently because of the fact that two of our patients who had non-toxic nodular goiters removed, and in whom the pathologist's diagnosis was "adenomatous goiter" with no evidence of malignancy found, have died from metastatic carcinoma of the thyroid. It seemed quite obvious that the failure to diagnose the cancer which was certainly present, was due in large part to the fact that the sections examined had not been taken from a portion of the gland which was malignant. Also it is possible that pathologists whose training was received in areas where goiter is uncommon, or more particularly those with European training only, may not be aware of some phases of thyroid pathology and therefore less alert to the diagnostic problems involved. We should bear in mind the statement made by Hertzler many years ago that in tumor of the thyroid there is sometimes a marked difference between clinical and pathologic malignancy.

As a result of this experience we have made a rather careful survey of the pathology in our own cases in the past two years. We have reviewed cases, where we had an opportunity of getting more than one section, some going back as far as ten years, and where in all of these cases examined, there was one or more nodules in the thyroid gland. This report is limited to 103 cases of non-toxic nodular goiters which have been removed surgically for various reasons. None of these were primarily toxic and malignancy had been suspected in only a few. In this group 21 true tumors were found, and 13 of these were malignant, essentially 13%. Interesting enough two more of these cases in addition to the first two quoted were first thought to be benign, but a more careful examination of the microscopic sections showed the presence of capsule and blood vessel invasion. Furthermore the slides examined were those from which the original diagnosis of non-malignant tumor had been made. Our diagnosis of malignancy in these specimens was confirmed by the opinions of two other pathologists, both of whom have had considerable experience in thyroid disease. Of the 13 patients in this group with malignant neoplasms, 6 have died of the original malignancy, and one has marked pulmonary metastases. The tumors consisted of the following types of pathology:—

Non-malignant tumors:

8 fetal adenomas

Malignant tumors: 13

4 papillary adenocarcinomas
1 Hurthle Cell carcinoma
2 adenocarcinomas
4 embryonal adenocarcinomas
2 carcinosarcomas

Four cases of Riedel's struma and three of Hashimoto's disease are not included in this report. For while they are clinically tumors of the thyroid, they are listed in most texts as being inflammatory conditions even though Hashimoto's disease is probably a lymphoid tumor.

For purposes of study we have included the so-called fetal adenomas in this series of cases as neoplasms. A careful examination of these adenomas should always be made because they

may be considered as precursors of malignancy or they may show evidence of being malignant adenomas. A fetal adenoma may be apparently benign in structure or it may also show evidence of mitotic activity, papillary structure formation, invasion of blood vessels, and capsule invasion. Eight of these cases appeared to be the benign type of fetal adenomas, while two adenocarcinomas appeared to have their origin in fetal adenomas. Several cases taken from this series are shown on the accompanying slides and quoted as examples.

Carcinoma of the thyroid may arise in an involuntary nodule or in a previously benign adenoma. Again, some carcinomas appear to begin primarily as a malignant process. Many times when the tumor is examined pathologically it is impossible to determine its origin with any degree of certainty but the more differentiated malignancies tend to resemble the nodular processes from which they originated.

Some primary thyroid carcinomas are surprisingly small. They may be too small to be palpated in the thyroid gland, and yet give rise to very large metastases in the cervical lymph nodes or in more distant parts of the body, such as the lungs, the bones, etc.

Of the individual cases reported, various types of pathology and symptoms were noted. One young man, aged 19 years, was examined because of three nodules in the left side of the neck. They were encapsulated, discrete, and not adherent to the adjacent structures. They were removed without difficulty and without opening into them in any way. The pathologist's report was "aberrant thyroid tissue". Since it is generally conceded that there is probably no such thing as lateral aberrant thyroids, but that they are always metastases in cervical lymph nodes from a primary carcinoma of the thyroid, a total lobectomy was done upon the left lobe and a small primary carcinoma was found. This tissue

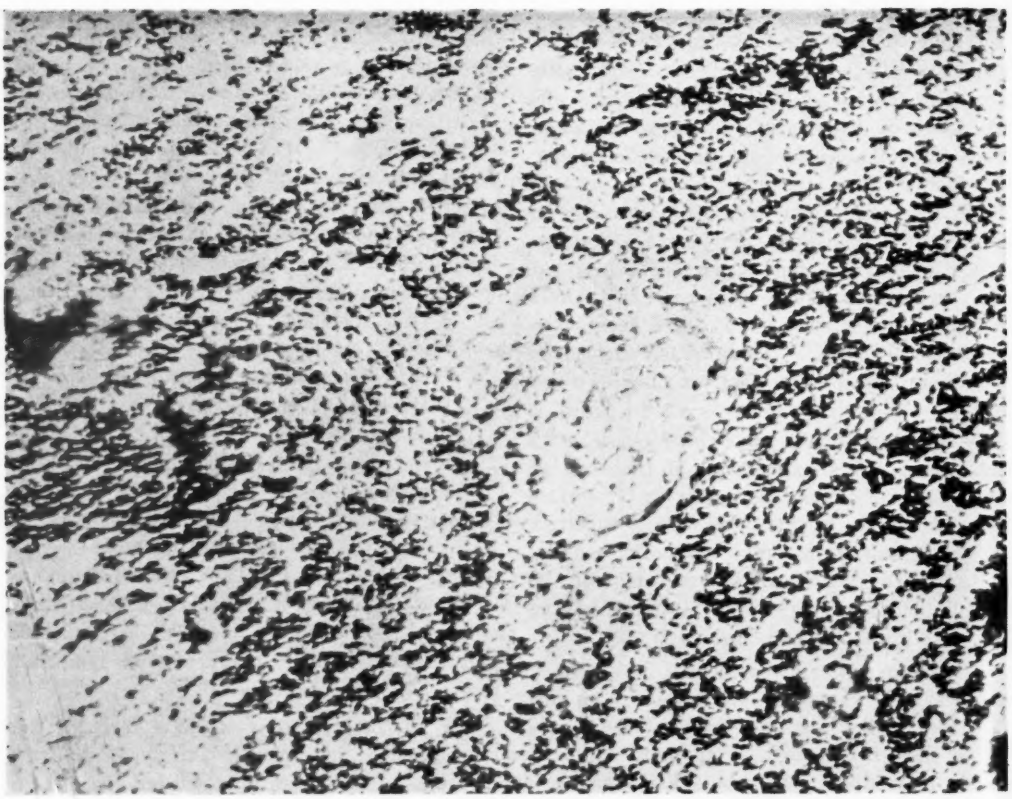

Figure 1. Papillary adenocarcinoma, metastatic in lymph node.

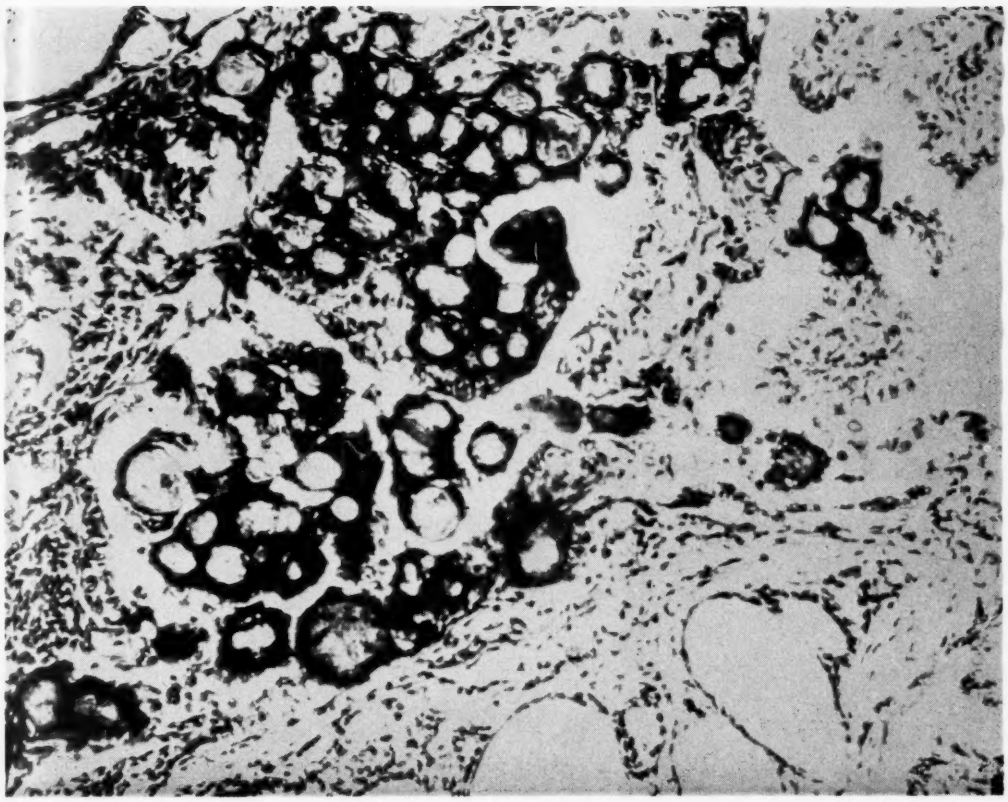

Figure 2. Papillary adenocarcinoma.

was found to be that of a papillary adenocarcinoma. Subsequently, re-examination of the cervical nodes resulted in the diagnosis of papillary adenocarcinoma from the same slides from which a diagnosis of benign tissue had been made.

Three of the fatal cases were found to have marked overgrowths that were microscopically papillary adenocarcinoma. All of these patients had recurrence which took place slowly. One of these died from suffocation, due to marked tracheal involvement. Tracheotomy was of only temporary relief. Another woman, quite elderly, developed pulmonary metastases four years after a thyroidectomy for papillary adenocarcinoma after having been in apparent excellent health. She has been referred recently to Dr. Clark of the University of Chicago for radioactive iodine therapy. The third case, also a young man, had a papillary adenocarcinoma of the thyroid gland removed by total lobectomy on the involved side. This patient died five years following surgery, from metastases to the cervical nodes and left iliac area. The metastatic growths were quite large, and yet no skeletal involvement could be found. The diagnosis was verified by autopsy.

Another variation of carcinoma was found in four cases of embryonal adenocarcinoma. These four cases each presented solitary nodules in the thyroid gland. Each solitary nodule was firm and had been steadily increasing in size. Carcinoma was diagnosed clinically in all four patients. The tumor was found to be composed of cords and interlacing trabeculae of large pale staining cells with little tendency to acinar formation. A total lobectomy was done in each of these cases and a subtotal lobectomy on the opposite side, which was apparently not involved. Three of these patients to date appear well with no evidence of recurrence, but they have not been

observed long enough postoperatively to judge their outcome.

We have had one case of the so-called "Hurthle Cell" type of neoplasm. The structure is that of a large eosinophil-celled tumor. This rather elderly man had a thyroid tumor of the right lobe, quite large, which was firm and growing slowly. On the left side the gland was soft, nodular, and had not enlarged during the past year. A bilateral subtotal removal was done and the tumor on the right side revealed the eosinoiphilic staining cells which seem characteristic of this quite rare type of thyroid malignancy. He has moved away and all contact has been lost so it is not known whether or not he has developed recurrence.

There has been a considerable difference of opinion as to whether true sarcoma occurs in the thyroid or if sarcoma-like cells are merely cancer cells of a high degree of malignancy. We have two such cases to report, one of which is typical of the fact often noted, of a malignant tumor appearing as a primary growth in what otherwise appears to have been normal thyroid tissue.

The first of these two, a woman aged 52, had a nodular tumor of the left lobe for many years. It was of slow growth but was finally removed for cosmetic reasons. At operation the tumor was left-sided and was removed rather completely. The right lobe was examined and was found to be small in size, soft, and normal in appearance, and being normal, was not disturbed. Microscopically the left lobe was a nodular colloid goiter. The patient remained well for two years when she noticed a small nodule in the upper pole of the right lobe. This doubled in size in a month and its removal was advised. For personal reasons this was postponed for another month during which time it quadrupled in size. Removal then gave gross evidence of a

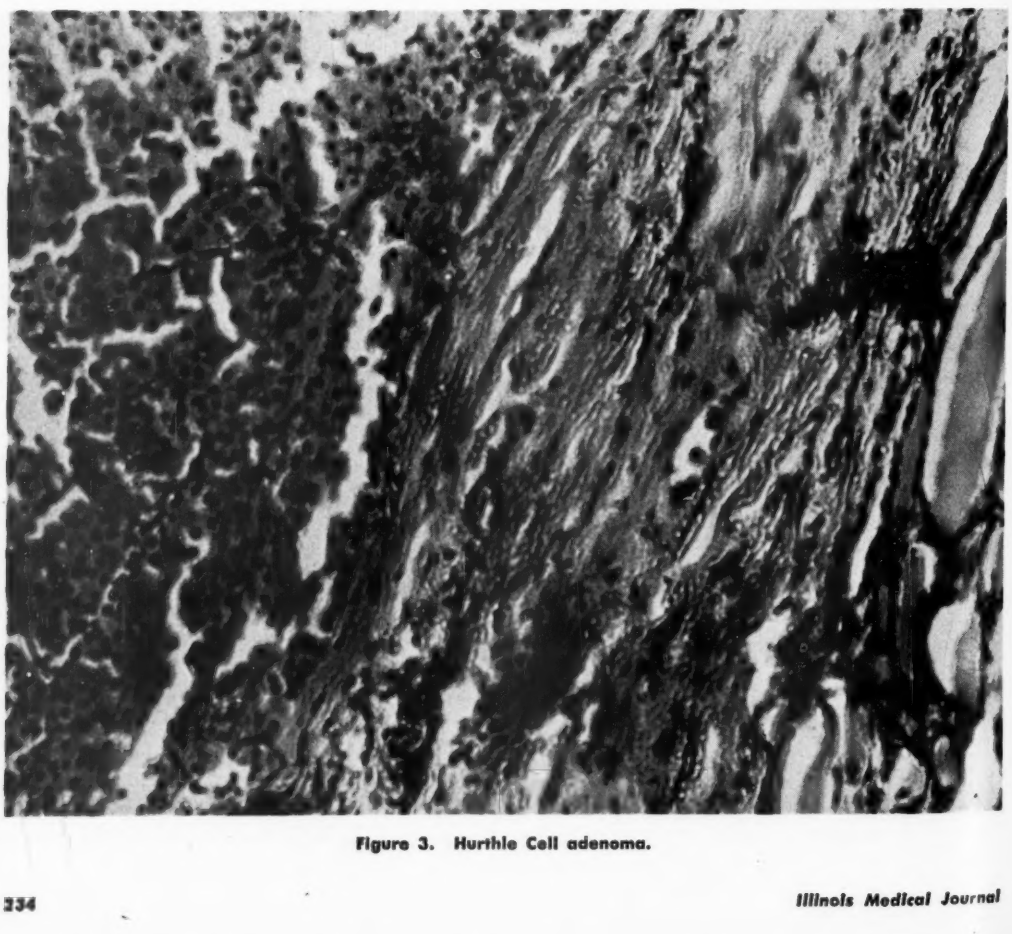

Figure 3. Hurthle Cell adenoma.

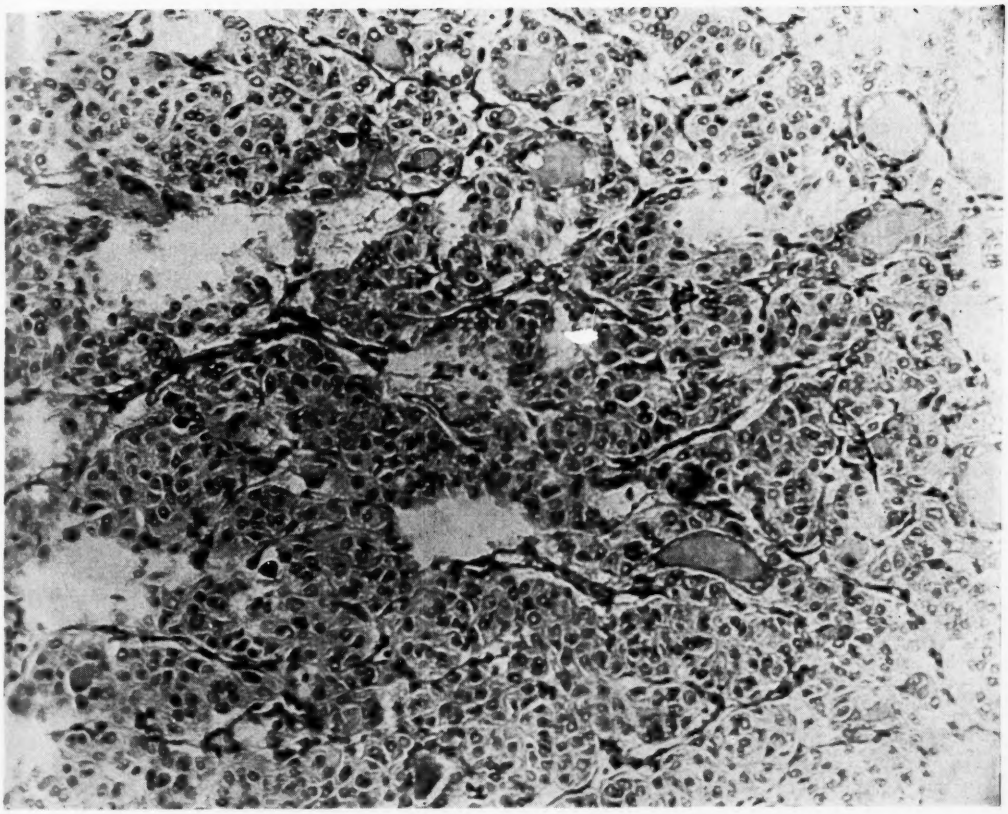

Figure 4. Embryonal adenocarcinoma.

malignant tumor, diffuse, soft, highly vascular, and infiltrating the adjacent tissues. The pathologist's report on this case stated that microscopically it was a sarcoma. Recurrence was rapid; it responded for awhile to x-ray therapy, but although distant metastases did not occur, local recurrence caused tracheal obstruction requiring tracheotomy. Ultimately in this case also, death from suffocation occurred, due to deeper tracheal involvement.

The second of these two cases was a young woman who presented herself for surgery with a large substernal goiter. She had known of this goiter for two years during which time she had had one child. The pregnancy and childbirth seemed to have no influence upon the growth of the tumor. That is, it did not, as many malignant tumors do, grow much more rapidly during pregnancy, and have a cessation of growth after pregnancy. At the time we saw her and at which time a thyroidectomy was performed, she was three months pregnant. Six months after the thyroidectomy she delivered a full term normal child and again, pregnancy did not seem to affect the tumor. At the time of operation the tumor was entirely in the thyroid capsule and extended down into the mediastinum. The right lobe was completely substernal and was removed with difficulty. The color of this tumor, that is the right lobe, was that of a pasty yellow, and it did not have the appearance of thyroid tissue. Its origin is a problem. The tumor was entirely within the thyroid capsule and yet grossly and microscopically appeared to be of non-thyroid tissue, the thyroid cells being completely replaced by the tumor cells. The specimen to be shown here has the appearance of a true sarcoma. Microscopically the structure appears to be a spindle cell sarcoma, perhaps the so-called carcinosarcoma. The patient is still alive three years following surgery with no evidence of recurrence

at this date. She has now had her third child, the second since the thyroidectomy.

These two sarcomas are excellent examples of the importance of distinguishing between pathologic and clinical malignancy. The first one was malignant microscopically. The cells which appeared to be of the sarcoma type were quite possibly epithelial in origin, but they were highly malignant both under the microscope as well as clinically. The rapid course and the fatal outcome fitted in with the microscopic appearance.

The second, which on the slide is a typical sarcoma and should be as highly malignant as it looks, is obviously a benign tumor on the basis of clinical findings even though it has been subjected to the stimulus of repeated pregnancies.

The two adenocarcinomas presented cancer cells arranged in sheets with capsule and blood vessel invasion. Both of these are living at present, without recurrence. However, both were removed while the lesions were quite recent in development and here as in cancer elsewhere, the time factor is perhaps of more importance than the extent of removal, providing that the removal is carefully and extensively done.

CONCLUSION

An attempt to make a correct evaluation between epithelial hyperplasias, benign neoplasms, and malignant neoplasms has been made in the cases studied. By proper clinical study and interpretation of the morphologic findings in the thyroid gland the dividing line between benign and malignant neoplasms may be clarified. As a result of re-evaluating the microscopic findings in this series of nodular goiters and correlating these findings with the follow up on the pa+ients clinically, we have found that at least in our experience it is advisable for the surgeon in charge of the case to keep in close personal contact with the microscopic findings on each thyroid tumor. We feel that while it

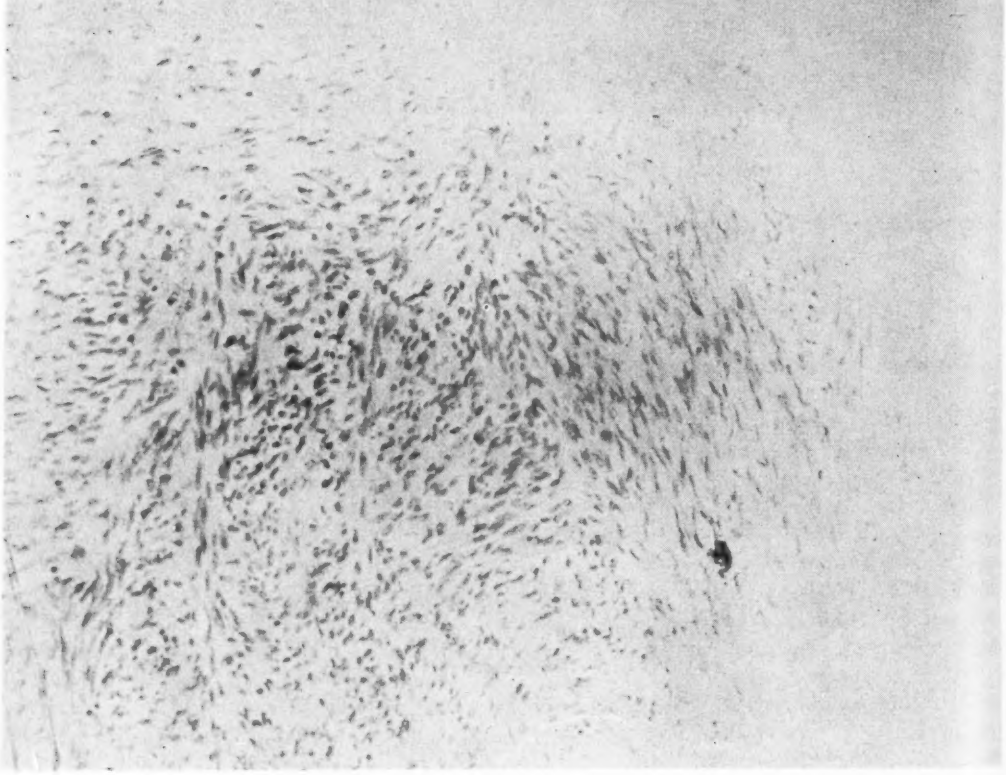

Figure 5. Carcino-sarcoma, probably a neurinoma.

is known that every nodular goiter may eventually become toxic, it is not so fully understood that it may also become malignant. We also believe that any tumor in the thyroid gland should be regarded as a potentially malignant tumor, and that its removal is usually justified.

We realize that a great many of the non-toxic nodular goiters which are soft, not growing, and which have been present for many years without symptoms, are not and probably will not become malignant. Their greatest danger is that of slowly becoming toxic and doing irreparable heart damage; but when the nodules become hard, or when a noticeable increase in size takes place, they should then be regarded as not only being potentially malignant but quite possibly as having already become malignant and removal should be much more extensive than is usually done.

Furthermore the presence of a solitary nodule in a young person carries a much higher likelihood of malignancy than any other type of thyroid tumor as shown in four of our cases. Some men place the incidence of malignancy in solitary nodules in the young individual as high as 25%.

The justification of thyroidectomy is brought out here when goiter is present and the possibility of malignancy is considered due to any of the previously mentioned signs. Two of our cases were diagnosed microscopically as being non-malignant, each with a fatal outcome due to recurrence. Two other cases which have been quoted were first diagnosed as benign neoplasms, but a more careful study of the same and other sections indicated the presence of carcinoma. This has made us feel that it is of great importance that the surgeon have a voice in selecting blocks of tissue from the thyroid gland for microscopic study and that he maintain an interest in microscopic pathology so as to share with the pathologist some of the responsibility in determining whether or not a tumor is malignant.

REFERENCES

Cole, W. J., Slaughter, D. P., & Rossiter, L. J.: J.A.M.A. 127-883, 1945

Graham, A., Surg., Gynec., & Obstet. **39**: 781-790, 1924

Graham, A., Annals of Surg., 82, 30 (1925)

Smith, Arch. of Path., 1930, 10, 524

Milles, G., Arch. of Path., **16**: 631, 1934

Crile, George Jr., Surg., Gynec., & Obstet. **62**: 995-999, 1936

Sloan, E. P., The Thyroid. Charles C. Thomas, Springfield, 1936

Hertzler, A. E., Diseases of the Thyroid Gland, C. V. Mosby Co., St. Louis, 1941

Thompson, W. O., Thompson, P. K., & Mandernach, D. M., West. J. Surg., Obstet., & Gynec., **55**: 50-58, January 1947

Jackson, Arnold, Western Surgical Assn. Transactions, 1948

VITAMIN B_{12}

To the microbiologist, vitamin B_{12} is one of the newest of the growth factors necessary for certain bacteria. To the biochemist, it appears to afford new information concerning nucleic acid synthesis. To the poultry scientist, it represents a further step in the elucidation of the nature of the factors necessary for the best hatchability of hens' eggs and the growth of chicks. To the physician, vitamin B_{12} appears to be the long-sought antiperniciousanemia principle of liver, and to afford new insight concerning the pathogenesis of a disorder that has fascinated medical men since its original description by Thomas Addison a century ago. *Excerpt: Medical Progress: Vitamin B_{12} and Pernicious Anemia, Maurice B. Strauss, M.D., Framingham, Mass., The New England J. of M., Aug. 3., 1950.*

The Practical Aspects in the Diagnosis of Virus Infections by Current Laboratory Technics

Richard A. Morrissey, B.S., M.P.H.
Chicago

The laboratory procedures that aid in the diagnosis of virus diseases have advanced considerably over those of even ten years ago. These tests are for the most part still highly specialized and not easily rendered by the ordinary clinical laboratory. Special facilities and suitably trained, careful workers are required. The procedures commonly used generally consist either of attempts to effect a direct isolation and identification of the virus or of tests designed to reveal the presence of antiviral antibodies in the patient's blood.

It should be pointed out in the beginning that virus laboratory diagnostic service, when it is available, can usually offer diagnosis only in retrospect, since only in rare instances can positive laboratory findings be demonstrated during the patient's illness.

The most conclusive evidence of a virus infection consists of the demonstration of an agent in tissue or body fluids that will produce a transmissible disease in animals by the inoculation of bacteria free material and the subsequent identification of this agent by appropriate serologic tests. Such a procedure is, to say the least, tedious and expensive, and requires highly trained personnel and an extensive museum of viral agents, specific immune sera and immunized animals.

Once isolated, identification is attempted or accomplished by the determination of the various animals for which the virus is pathogenic, the routes by which it will infect, its tissue selectivity, the pathologic lesions produced (including the presence of inclusion bodies) and finally, the demonstration of a protection against the agent by antisera or vaccines of known virus agents.

The isolation and identification of viral and rickettsial agents must still be considered as research problems. Only occasionally will the isolation of the agent provide useful information that cannot otherwise be obtained more easily and cheaply by serologic methods now available for most of the common virus infections of man. Virus isolation studies, however, still hold an important place in the advancement of our still inadequate knowledge of virus diseases. These studies are important, for example, in the identification of new immunologically distinct strains of influenza that may appear and be unaffected by present vaccines, the discovery of new agents responsible for such diseases as the atypical pneumonias, central nervous system infections and gastrointestinal diseases of suspected virus origin, for which no agent has yet been discovered.

After identification of a virus, it is important to determine whether it was present in the body of the patient or the laboratory animal, as an incidental contaminant, or was actually the cause of the patient's illness. Strong reliance must often be placed on the results of a comparison of immunologic tests on the patient's sera taken during the acute phase and also during the convalescent stage of the disease, to demonstrate a rise in antibodies against the specific virus after the onset of clinical symptoms.

Serologic methods have provided the basis for our growing knowledge of virus diseases. The techniques are designed to demonstrate the appearance of specific antibodies to known viral and rickettsial agents during or following the course of an illness. Very early in the era of our knowledge of virus diseases, neutralizing anti-

---

Bacteriologist in Charge of Virus Laboratory, Illinois Department of Public Health, Chicago.

Presented before the Section on Pathology, 109th Annual Meeting, Illinois State Medical Society, Chicago, May 17, 1949.

bodies, agglutinins and complement fixing antibodies were demonstrated in the sera of animals and humans convalescent from viral infections. More recently it was discovered that influenza virus was capable of agglutinating the red cells of humans, guinea pigs, and fowls. This property was subsequently shown to be present in other viruses, namely vaccinia, variola, mumps, Newcastle virus and other viruses of animals. Finally it was observed that this hemagglutinating power was inhibited by specific antisera for these viruses. This work has since become the basis for a new and valuable serologic test for these agents.

The most widely applicable of the serological techniques is the neutralization test based on the development of virus inactivating antibodies in blood as a result of infection with a specific virus. The serum to be tested is mixed with a suspected virus and then inoculated into a susceptible animal. A control test of the virus and a known negative serum is run in parallel and a comparison of the infectivity of the virus in the presence of the two sera is made on the basis of deaths or other specific signs of infection. The choice of the route of inoculation of the serum-virus mixture and the choice of the animal will vary for different viruses, but mice and the chick embryo are the most commonly used.

A knowledge of the time of the appearance of neutralizing antibodies in various virus infection is important in the proper interpretation of the neutralization test. These antibodies may appear as soon as the first week of illness in certain virus infections such as the equine encephalitides but they generally do not make their appearance in many virus infections until after 4 to 8 weeks. The test is therefore limited in most instances to the identification of a past infection rather than the current illness. Since neutralizing antibodies usually persist for years after infection, the test is valuable in epidemiological surveys to demonstrate previous inapparent or unrecognized infections in a population, but this fact must be considered in the diagnosis of any current illness and therefore it is highly important that a specimen of serum drawn early in the disease be shown to have been negative before a later positive result can be reliably interpreted as diagnostic for the specific illness. The test also provides the most conclusive basis for the identification of newly isolated viruses as well as the classification of immunological substrains within a broad group of related viruses.

Although the neutralization test has wider application than other diagnostic tests it is less desirable as a practical routine procedure for a number of reasons. Neutralizing antibodies tend to deteriorate rapidly unless sera are kept frozen. This usually limits the use of the test to specimens that can be brought immediately to the laboratory and kept under proper storage or can be shipped in dry ice. The test involves considerable expense per specimen due to the number of animals used. It involves the maintenance of a ready stock of virus agents and special precautions for the handling of highly infectious materials.

By comparison with the neutralization test the complement fixation test is a relatively new tool in the field of virus diagnosis. The development of this test as a diagnostic procedure has long been retarded due to the difficulty in preparing suitable antigens from tissue suspensions. The virus content of infected tissues is at best, very slight. Crude preparations contain substances interfering in the reaction, are frequently unstable and often became anticomplementary.

Within the last few years, considerable progress has been made in the concentration and purification of antigens for most of the viral and rickettsial agents. These antigens are still relatively crude and may vary in potency, specificity and stability. Little experience has been accumulated in their use in human infections and our knowledge of non-specific reactions in other diseases may still need to be modified. The test must still be carefully controlled and preferably confirmed by the neutralization test whenever possible. Despite these limitations, the complement fixation reaction provides the most available diagnostic tool that can be placed at the disposal of the physician through the clinical laboratory equipped to do the Wasserman test. When properly carried out, the complement fixation test is the method of choice because it usually permits diagnosis earlier than any other test, within 10 days to 2 weeks after onset. It is particularly valuable in the diagnosis of equine, mumps and St. Louis encephalitis, lymphocytic choriomeningitis, the psittacosis-lymphogranuloma and the rickettsial infections. Just as in the other serologic procedure, a rise in antibody titer must be demonstrated during the course of

the illness before a reliable diagnosis can be made.

Knowledge of certain virus infections of the respiratory tract has increased greatly within the short span of 15 years. Several distinct types of influenza virus have been isolated and widely studied. A number of immunologically related viruses of the psittacosis—lymphogranuloma group have been sharply delineated. The mumps virus has been isolated and propagated in chick embryos and extensively studied. The virus of lymphocytic choriomeningitis has been demonstrated in pneumonitis and influenza-like infections in man. These well defined specific infections, however, comprise the lesser part of the problem of virus infections of the respiratory tract. Within the last 10 years, primary atypical pneumonia has become the commonest form of pneumonia. Although numerous transmission studies in animals and man have indicated a virus as the responsible agent, the identity of the agent or agents has not been established. The presence of agglutinins to human red cells at low temperature and agglutinins against a variant streptococcus have been shown to be present in a variable percentage of these cases, but these tests offer little useful information. A number of viral and rickettsial agents can produce a disease similar to the common clinical syndrome of atypical pneumonia. These include the rickettsial agents of "Q" fever and the psittacosis-lymphogranuloma group. Reliable complement fixation tests are now available for most of these. Numerous agents of the psittacosis group have been isolated from human cases of virus pneumonia, presumably unassociated with avian reservoirs of infection. The agents of this group which also includes the virus of lymphogranuloma-venereum are tentatively classified in an intermediate position between the rickettsiae and the viruses. All of the agents produce tiny coccoid elementary bodies, stainable with basic dyes and visible under the microscope. All members of the group may be propagated on the chick embryo and infect mice by either the intranasal and intraperitoneal route, or both of them and usually always by the intracerebral route. On the basis of the complement fixation test they are antigenically related. The latest agent of the group isolated from cases of pneumonitis in Louisiana differs from the others by producing also a severe infection in guinea pigs.

Infection by agents of the psittacosis group is followed by the appearance of complement fixation antibodies in the blood, often as early as 4-8 days after onset but neutralizing antibodies appear irregularly and of low titer. They are therefore of little value in diagnosis. Since all agents of the group are immunologically related, a positive complement fixation with an antigen of any member of the group does not indicate which agent is involved since they all will react. For example, a positive test against the psittacosis antigen may mean the patient has or has had lymphogranuloma-venereum. It is therefore important that a definite rise in antibody titer be demonstrated during the course of the illness and that the presence of lymphogranuloma-venereum infection be ruled out. This permits a reasonably certain diagnosis of a virus infection with a member of the psittacosis group. The identification of the agent involved within the group requires the isolation of the virus from the sputum or lung tissue, and its subsequent identification by cross immunization tests in mice.

Diagnostic techniques for influenza have advanced more rapidly in recent years than those for any other virus infection of man. The development of the simple virus culture technique, using the chick embryo for growing the virus, the discovery of the red-cell agglutinating test as an indicator of the presence of the virus and the equally valuable discovery of the power of immune sera to inhibit this reaction all have resulted in a tremendous advancement of our knowledge of this virus disease. Unfortunately, the short duration of the disease and time required to secure diagnostic results still restricts the value of the diagnosis as it concerns the practicing physician. The principal use of the laboratory in influenza studies has been as a tool for the epidemiologist. With the appearance of an epidemic of an influenza-like respiratory disease, the laboratory attempts to identify the epidemic as influenza and further to identify the strain or strains of the virus involved. The same general methods applying to other viruses hold also for influenza. Attempt is made to isolate the virus from throat washings by the inoculation of developing eggs, mice and ferrets and to demonstrate rising antibody titer in the patient's acute and convalescent sera. This rise in titer may be demonstrated by the commonly used red-

cell agglutinin-inhibition test, the complement fixation or the neutralization tests. One essential difference in the interpretation of serologic reactions characterizes influenza. Almost all adults have circulating antibodies for the principal influenza types at the onset of infection. Between 6 and 10 days after the onset of illness, the antibody titer for the type of influenza virus causing the illness begins to rise and reaches a maximum in 2 or 3 weeks after which the level begins to decline. It is therefore absolutely necessary to have acute and convalescent phase serum specimens on which to make comparison.

Neurotropic.—There is a large group of neurotropic virus infections of man frequently encountered in epidemic form with well delineated seasonal and geographic distribution. Only those of importance in this country will be mentioned. Certain of these can now be grouped as arthropod-borne diseases, since the viruses have been isolated from mosquitoes, ticks, and mites, and convincing evidence exists to indicate that these invertebrate hosts may be vectors. The Eastern and Western strains of equine and St. Louis encephalitis viruses are present in various parts of this country. Lymphocytic choriomeningitis virus should be considered also, since its diagnosis and clinical manifestations follow the general pattern, although it is believed to be spread most commonly by excreta of rodents and has a more widespread occurrence with no sharp seasonal manifestation. Mumps encephalitis is not uncommon and is being recognized with greater frequency due to improved methods of diagnosis.

Most of the diseases in this group range in severity from a mild illness, with no indication of primary involvement of the central nervous system, to a severe syndrome characterized by stupor, tremors, convulsions, coma, and death. In diseases due to the St. Louis and equine viruses, the virus is rarely if ever found in blood or spinal fluid and therefore serologic methods alone are available for laboratory diagnosis, unless the disease is fatal, thus offering opportunity of isolating the virus from the central nervous system tissue. The lymphocytic choriomeningitis virus, on the other hand, is present in the blood and spinal fluid, and may be isolated with comparative ease. The mumps virus may also be isolated from spinal fluid in central nervous system infections.

In the midwest, the viruses of both Eastern and Western equine, as well as St. Louis lymphocytic and mumps are usually considered.

The first specimen of blood for diagnosis should be taken as soon as a neurotropic virus infection is suspected. The sooner the better. If taken early enough in infections with the equine viruses, this sample will fail to neutralize and in such instances, interpretation of a later positive is greatly facilitated. The next specimen may be taken between 2 and 3 weeks after onset, in the hope for an early diagnosis, but a negative result cannot be considered significant. A specimen taken 30 to 60 days after onset, preferably the longer interval, may sometimes be essential.

A large number of encephalitis cases still occur with which no known virus agents can be related, at the present time. In view of the possibility that these cases may represent infections, due to still unknown agents, the virus laboratory as one of its primary functions should make every attempt to isolate new agents from central nervous system tissues of such cases.

Poliomyelitis should be mentioned separately since there is as yet no practical immunologic tests which can be applied for purposes of clinical diagnosis. Virus isolation requires the use of monkeys and a correspondingly greater expense and effort in carrying out such studies. Isolation studies require from 2 to 5 weeks in the best equipped laboratory and therefore offer little value to the clinician.

In summary it should be stated that the generalizations that I have tried to make are based on the accumulated experience of a number of workers in the field. So much variation occurs in the behavior of viruses and their immunological reactions that few generalizations can be made without qualification. We can safely say that for reliable serological evidence of virus infection, blood must be taken within a few days after onset of symptoms and again after 2 or more weeks. Negative results on blood drawn earlier than 6 to 8 weeks after onset may often not be reliable. The detection of specific virus antibodies in a single specimen particularly if they are present in low titer, if of dubious diagnostic value since the serum of many persons may contain antibodies as the result of a previous infection that may or may not have been recog-

nized. If antibodies against a specific virus are absent early in the course of the disease and appear during the illness or in convalescence, it is reasonable to believe that this agent was the cause of the disease.

The proper submission of specimens to the laboratory plays an important part in determining the success or failure of virus diagnostic studies. At least 20 cc of blood should be drawn aseptically after the patient has fasted several hours. Serum should be removed from the clot within a short time if the specimen cannot be delivered promptly to the laboratory. All material such as throat washings, sputum, spinal fluid and tissue submitted for virus isolation studies must be frozen in dry ice while fresh and maintained in this state until they reach the laboratory.

Often a specimen of blood is sent to the laboratory with a request that a virus diagnosis be made, without any indication of what disease the patient might have, or of when the blood was taken in relation to the onset of symptoms. This practice as well as that of submitting blood specimens on all cases with vague symptoms of doubtful diagnosis, can seriously overburden the virus laboratory to the point where work of a more important nature is hindered.

The Illinois Department of Public Health provides limited facilities in the Chicago laboratory for making serological tests for most of the common viral and rickettsial infections. In special cases of public health importance or where an unusual frequency of cases of a suspected virus disease occurs, these facilities are concentrated on more extensive research studies to attempt an isolation and identification of the etiologic agent. Consultation with the laboratory should be made where isolation of the agent is desired.

Virus diagnostic service of a limited nature is also available in several hospitals in Chicago, and also through the United States Public Health Service laboratories in Bethesda, Md., Montgomery, Ala. and Chamblee, Ga.

DISCUSSION

Dr. Goodbloom: I would like to ask if any virus has been isolated in diarrheas of the newborn, particularly those in which no bacterial agency has been discovered?

Dr. Devine: I would like to ask if there is anything of value in the question of measles encephalitis and any indication of virus disease?

Dr. Pilot: I'd like to ask if it is possible to get early diagnosis of rickettsial virus diseases with blood samples like we do for blood cultures? In one laboratory during the war we obtained excellent diagnostic work in rickettsial diseases. When patients were suspected of an acute rickettsial disease, we drew samples of blood and injected a guinea pig intraperitoneally. Temperature elevation was obtained and later smears of the spleen with the special stain for rickettsiae. In this way we were able to make early diagnosis in our soldiers, particularly in Texas. Later, the complement fixation test gave excellent results with sharp differences of Q fever and murine typhus, Bullis fever, etc. In bacteriological diagnosis, typhoid, streptococci and brucella organisms are obtained early in the blood culture. If we could get some febrile studies, specific reactions on egg cultures from blood samples, then earlier diagnosis of virus and rickettsiae diseases in the clinical patients would be possible.

Mr. Morrissey: There has been a considerable amount of work done on the infectious diarrheas of the newborn and on epidemic gastro-enteritis of suspected virus origin. Some of the results suggest a virus type agent as the cause. In one instance, the agent has been inoculated on the cornea of rabbits, producing typical lesions that could be serially transmitted in this manner. This work has not been duplicated in other investigations. An agent has also been transmitted thru nose and throat washings and fecal filtrates to human volunteers to produce a gastro-enteritis. Other workers have been able to transmit a virus type agent from epidemics of infant diarrhea to young calves. These reports have not been confirmed by other workers, and furthermore, the techniques involved do not lend themselves easily to practical diagnostic use.

The other question referred to diagnostic tests in measles encephalitis. We are interested, at present, in this particular problem, since we have had specimens from two recent deaths, from encephalitis, following shortly after an attack of measles. We have had only negative results from serological tests and virus isolation studies on these specimens. As far as we know, no virus has been demonstrated in measles encephalitis.

Regarding the question on rickettsia diagnosis, I did neglect to mention that animal inoculation does provide an early diagnostic test for rickettsial infections.

The Role of the Radiologist in the Diagnosis of Bronchogenic Carcinoma

Cesare Gianturco, M.D.
Carle Hospital Clinic
Urbana

In 1942 the U. S. census showed that carcinoma of the lung accounted for 4 per cent of all cancer deaths. In 1947 Rubin[1] stated that carcinoma of the lung occurred in 10 per cent of the cancer patients seen at Montefiore Hospital in New York. There is no doubt that the statistical incidence of carcinoma of the lung has increased in recent years. This is due to the fact that an increased life expectancy allows more people to reach the older age at which cancer of the lung occurs and to the fact that only recently surgical progress and better means of diagnosis have stimulated the interest of the profession in this disease.

Probably the most outstanding recent contribution to the diagnosis of bronchogenic carcinoma is the microscopic examination of bronchial secretions. This investigation is based on the presence of desquamated carcinoma cells in the expectoration or in the secretion collected at bronchoscopy. According to Papanicolaou[2] this method allows trained pathologists an accuracy of about 85 per cent in the diagnosis of carcinoma of the lung. Woolner and McDonald[3] reported several cases in which a cytological diagnosis of carcinoma of the lung was made before the appearance of any radiological signs. Such an accuracy would relegate radiological diagnosis of lung tumors to a secondary role if all patients were examined at an early stage of the disease. This however is not the case and since patients complaining of cough, hemoptysis, and weight loss may suffer from a number of diseases, a radiological study remains an essential part of the comprehensive examination which must be given these patients. Radiology however has definite limitations in the diagnosis of bronchogenic carcinoma and these limitations are not generally understood. The main limitations arise from the fact that in most cases roentgen rays will not show the tumor itself but only the changes which occur in the lung following partial or complete obstruction of a bronchus. This situation is very different from those encountered in the gastro-intestinal tract or in the skeleton where the tumor can be actually visualized and its characteristics studied in detail. About 75 per cent of lung carcinomas arise within the lumen of a large bronchus. This is unfortunate because the tumor may grow to a considerable size and possibly extend to the hilar glands before obstructing the air flow enough to give radiological signs. Such tumors may cause hemoptysis, cough, and weight loss but the chest film will show no significant pathology, (Figure 1, N). The clinician must be very alert in these cases. Such small tumors can be diagnosed by bronchoscopy, bronchography or cytologically much before the radiologists can detect them in a film of the chest. The clinician must keep in mind the possibility of carcinoma in spite of a negative chest film.

As the tumor continues to grow, it reaches a size where it almost obstructs the lumen of the bronchus. At this stage the peculiar mechanism described by Jackson comes into play. Since the diameter of the bronchi increases during inspiration, air slips by the tumor but in the expiratory phase, the diameter of the bronchi becomes smaller and air is trapped in the distal lung. This leads to obstuctive emphysema (Figure 1, E) and the emphysematous lung will appear in the roentgenogram better aerated than the remainder of the lung tissue. If the emphysematous portion is large enough, there may be displacement of the mediastinal structures toward the opposite side of the chest, depression of the diaphragm, widening of intercostal spaces on the affected side. Obstructive emphysema, however, is a phenomenon of short duration. Eventually the tumor grows large enough to

Read before the General Assembly, 109th Annual Meeting Ill. State Med. Soc., Chicago, May 18, 1949.

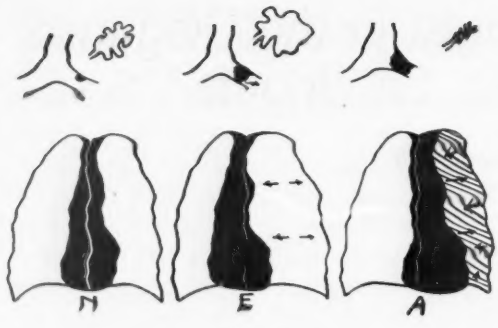

Figure 1

N. Negative chest in the presence of a small tumor in the left main bronchus.

E. Emphysema of the left lung due to a tumor which almost obstructs the left main bronchus.

A. Atelectasis of the left lung due to a tumor which completely obstructs the left main bronchus.

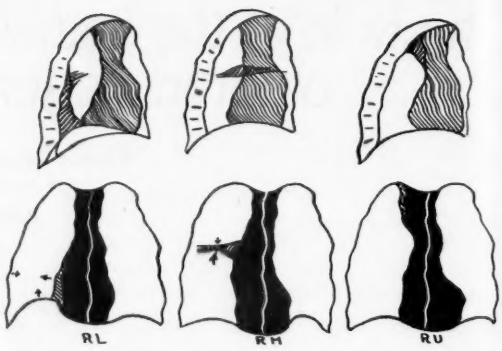

Figure 2

RL. Atelectasis of the right lower lobe.

RM. Atelectasis of the right middle lobe.

RU. Atelectasis of the right upper lobe.

obstruct the bronchus completely producing atelectasis of the distal lung (Figure 1, A).

Atelectasis is indeed the cardinal, if somewhat late, sign of bronchogenic carcinoma and it is *important that one be familiar with its roentgen* appearance in the various lobes (Figure 2). The clear cut appearance of atelectasis follows the anatomical shape and location of the various lobes and it is accompanied by changes due to the decreased lung volume. The mediastinal shadows are displaced toward the affected side and show a pendular movement during fluoroscopy. The intercostal spaces are narrowed, the *diaphragm elevated on the affected side. These* changes are more evident in atelectasis of the *large lower lobes than in atelectasis of the smaller* middle or upper lobes. It should be remembered *that the shadow of an atelectatic lobe may be* quite large but this is no indication of the size of the tumor. The tumor itself needs to be only large enough to obstruct the bronchus. In addition to the changes due to atelectasis, later in the disease, the radiologist may observe rib erosion, especially in the upper lobe tumors which give rise to the Horner's syndrome and are prone to invade the thoracic cage.

About 25 per cent of lung carcinomas arise in the periphery of the lung. These tumors may *be bronchogenic or originate from the alveolar* epithelium. The peripheral bronchogenic tumors presents essentially the same roentgen characteristics as those arising in the large bronchi, producing localized emphysema (Figure 3, E) and later atelectasis (Figure 3, AT) usually wedge shaped with the apex directed centrally.

Infection of the atelectatic lung plays a great role in many cases and lung abscesses of carci*nomatous origin are frequent enough (Figure 3,* AB) that one should always suspect carcinoma when single or multiple abscess cavities are seen. These abscesses usually have thicker and more irregular walls than the common pyogenic abscesses and respond poorly to medical and surgical treatment.

Bronchogenic carcinoma in the hilar region can cause sufficient pressure on the vessels to pro*duce venous engorgement (Figure 4, V). This be*comes apparent in the radiograph only when such tumors grow more outside than inside of the bronchial lumen so that venous engorgement precedes atelectasis.

Some tumors invade the lymphatic pathways in a retrograde fashion. If this is not masked by atelectasis, the lung will assume a reticular appearance (Figure 4, L).

At times it is difficult to distinguish between a bronchogenic carcinoma of a large bronchus *and a centrally located mass of other origin* (Figure 4, C). In a general way, however, large *hilar masses bordered by clear lung are rarely due* to bronchogenic carcinoma. Lateral views will *localize such masses and it will be found that* most of the anterior masses belong to the thymus, dermoid, and vascular groups. The middle ones originate from the hilar glands and the posterior masses from the pleura, nervous system, or the

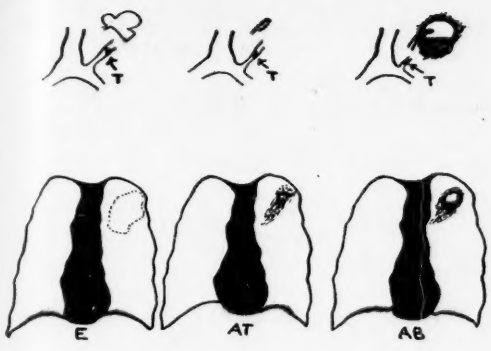

Figure 3

E. ***Localized emphysema due to partial obstruction of a small bronchus.***

AT. ***Localized atelectasis due to complete obstruction of a small bronchus.***

AB. ***Abscess following infection of the atelectatic area.***

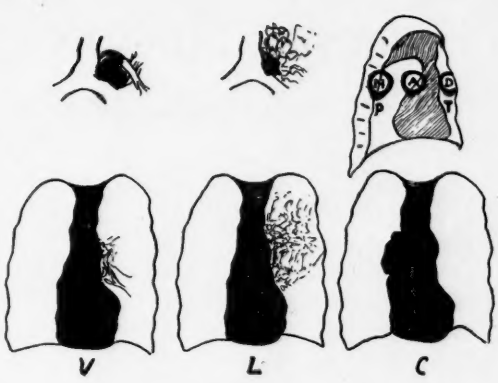

Figure 4

V. ***Venous engorgement due to a tumor in the hilar region.***

L. ***Retrograde malignant lymphatic involvement of the lung parenchyma.***

C. ***Centrally located masses due to neurogenic or pleural tumors (NP), adenopathy (A), or to dermoid or thymic tumors (DT).***

aorta. Bilateral paramediastinal masses also tend to exclude bronchogenic carcinoma.

This brief review of the radiologic aspects of bronchogenic carcinoma shows that the radiologist can suspect such a tumor only after it has reached a fairly large size. For tumors arising in the large main bronchi, this is rather late in the course of the disease.

It should be realized that the diagnosis of chest diseases is a matter of team work. The role of the radiologist on this team is an important one but should not be over-emphasized. This may be illustrated by the following examples:

A. A patient presents himself complaining of cough, weight loss, hemoptysis. He may have a number of disease. The radiologist can be of great help if he can establish a diagnosis other than carcinoma of the lung.

B. The chest film discloses localized emphysema or atelectasis. The radiologist suggests a diagnosis of carcinoma and localizes the obstructed bronchus. This is the usual, rather late case, in which surgical results are not good.

C. A patient complaining of cough, weight loss, hemoptysis presents a normal chest film. In this case it is essential that the clinician be alert and ask for cytological, bronchoscopic and bronchographic study. These examinations may disclose an early, non-obstructing bronchogenic carcinoma which will respond well to surgery. A negative chest film thus becomes the most important contribution that a radiologist can make toward the early diagnosis of carcinoma of the lung.

D. A patient who complains of weight loss, cough, hemoptysis and has a negative chest film may also be cytologically, bronchoscopically and bronchographically negative. In this case, one should not rely only on repeated x-ray examinations but also repeat cytological studies of the sputum. If this patient has a carcinoma, the cytological study is likely to become positive before the bronchus is obstructed enough to give radiological signs.

These examples show that although the radiologist is an essential component of a diagnostic chest team, the burden of early diagnosis of carcinoma of the lung should not rest upon him. This burden rests principally upon the men of clinical medicine who must be constantly aware of this frequent disease. If a diagnosis of carcinoma of the lung can be made before the appearance of radiological signs, a negative chest film will be the best assurance of a good surgical result.

REFERENCES

1. Rubin, E. H.: Diseases of Chest. W. Saunders and Co., *Philadelphia, 1947.*
2. Papanicolaou, G. N.: Diagnostic Value of Exfoliated Cells From Cancerous Tissue. *J. A. M. A., 131: 372,* June, 1946.
3. Woolner, L. B. and McDonald, John R.: Diagnosis of *Carcinoma of the Lung. J. A. M. A., 139: 497,* February, 1949.

Caustic Strictures of the Esophagus

Paul H. Holinger, M.D. and Kenneth C. Johnston, M.D.
Chicago

The full impact of the significance of the tragedy which strikes a child who has swallowed a caustic is rarely realized at the time of the accident. Irreversible changes occur due to the burn which damage the smooth mucosal surface of the esophagus. Scar tissue which replaces the mucosa in the denuded areas slowly but continually contracts for the duration of the patient's life to produce either a rapid cicatricial atresia of the esophagus or a slowly progressing stenosis. The fact that such a life-time process can develop from a single swallow of lye is not generally appreciated, and the untreated patient is not fully aware of the significance of the slight but progressively increasing dysphagia.

This paper, therefore, is presented to review the subject of caustic strictures of the esophagus and to point out the need for early continued active treatment. A series of 96 consecutive cases is presented to stress the etiology, pathology, and the various forms of treatment used in the management of the acute burn and the well-developed strictures. Special emphasis is placed on the fact that a patient who has swallowed a caustic must be observed for a period of years to insure a patent esophagus. A series of tight esophageal strictures may be found in a patient years after the ingestion of a caustic. Occasional esophageal dilatations at regular intervals after the accident will prevent this complication in later life.

This study is based on a series of 96 patients who have swallowed various types of caustics. It includes all such patients examined and treated in the Broncho-Esophagological Clinics of The Children's Memorial Hospital, St. Luke's Hospital, and The Research and Educational Hospitals of The University of Illinois College of Medicine, Chicago, during the 13 year period from 1936 through 1948. (Table 1.)

From the Department of Otology, Rhinology, and Laryngology (Broncho-Esophagology), University of Illinois, College of Medicine, The Children's Memorial Hospital, and St. Luke's Hospital, Chicago.

Read before the General Assembly, 109th Annual Meeting of the Illinois State Medical Society, Chicago, May 18, 1949.

ETIOLOGY

Type of Caustic. Lye, with which is included the commercially packaged Chlorox, Drano, Saniflush, etc., was the predominating caustic encountered in this group; in 74, or 77%, of the cases this caustic was swallowed. Nine, or approximately 9.5%, of the patients had swallowed ammonia. Five, or 5%, had swallowed an acid such as sulphuric acid, nitric acid or muriatic acid used in soldering. Eight, or 8.5%, had swallowed iodine, carbolic acid, lysol or lactic acid.

Age at the Time of the Accident. This significant etiologic factor divides the patients into four groups. Fifty-five, or 57.3%, of the patients swallowed the caustic before they were 5 years of age; seven, or 7.3%, between 5 and 10 years of age; nine, or 9.4%, between 11 and 20 years of age; and twenty-five, or 26%, were adults over 20 years of age.

In correlating the two etiologic points of type of caustic and age at time of accident, the reason the patients may be divided into these four principal groups becomes evident. The first group (55 cases), by far the largest group, is composed of children who have ingested the caustic by accident. The caustic was almost always swallowed by the child because it had been placed in a container usually used for food — a cup, a glass, a soda pop bottle or a Coca-cola bottle. However, "medicine cabinet" accidents also played a significant role in this group. Iodine or lysol mistaken for cough mixtures were given to children, or the children reached into a medicine cabinet for one of the bottles containing these solutions and swallowed its contents. Undiluted lactic acid used for the preparation of lactic acid milk was given by mistake to one infant by his mother; the lactic acid and some cod liver oil had been dispensed in almost identical bottles, and 10 drops of the former had been given directly to the infant instead of 10 drops of cod liver oil. In the second group (7 cases),

TABLE 1

	Total Number	Sex		Race		Type of Caustic					
		M	F	W	C	Lye*	Lysol	Ammonia	Nitric or Sulphuric Acid	Iodine	Lactic Acid
Group I 0-5 yrs.	55	30	25	42	13	44	4	3	2	1	1
Group II 6-10 yrs.	7	6	1	4	3	6			1		
Group III 11-20 yrs.	9	0	9	9	0	9					
Group IV over 20 yrs.	25	9	16	21	4	15	2	6	2		
Total	96	45	51	76	20	74	6	9	5	1	1

*Includes Drano, Chlorox, Saniflush, etc.

there were 6 boys and 1 girl between the ages of 5 and 10 years at the time of accident. They had swallowed lye (6 cases) on a "dare" and acid (1 case) because it was found in a Coca-cola bottle used for soldering solution in work-shop.

The third group of patients (9 cases) is found to consist of young girls who attempted, dramatically, to swallow a poison because of disappointment in a love affair or because of some problem at home which had ended with a severe disciplinary measure. Lye was the caustic used in each case.

The fourth group consisted almost entirely of adults who had developed well recognized psychopathic personalities with periods of depression during which they made feeble attempts at suicide by swallowing a small quantity of lye, lysol, ammonia or acid. During severe depressions such patients may swallow a large quantity of caustic from which they may die in a few days of chemical mediastinitis or peritonitis. Three cases of accidental caustic ingestion are listed in this group.

The sex incidence of the four groups is significant. In the first group of 55 children under 5 years of age at the time of ingestion of the caustic there were 30 boys and 25 girls. As mentioned, of the 7 children 5 to 10 years of age, 6 were boys. The 9 patients who swallowed caustics between the ages of 11 and 20 years were all female. Of the 25 patients over 20 years of age there were 9 males and 16 females. It is interesting that in the entire group of 96 patients, there were 45 males and 51 females.

The race incidence shows a total of 76 white and 20 negro patients. Forty-two of the 55 children of Group I were white; 13 were negro. In Group II, 4 were white, 3 negro. In Group III, all 9 were white. In Group IV, 21 of the 25 were white, 4 negro.

PATHOLOGY

The Acute Burn. Thirty-one, or 32%, of the 96 patients were seen within the first 2 weeks of the ingestion of the caustic and are considered as having been seen during the acute stage of the burn. Following the ingestion of the caustic, the face, tongue, pharynx, larynx, esophagus, stomach and duodenum were found involved in varying degrees. Children who swallowed only a small amount of the caustic often had extensive burns around the face, over the chest, and on the hands. The lips, tongue, buccal mucosa, hard and soft palates, and pharyngeal mucosa were swollen, ulcerated and covered with a white exudate which subsequently desquamated to leave patchy ulcerated areas throughout the mouth. Esophagitis, periesophagitis and mediastinitis were frequently demonstrable on chest x-ray, apparent by the wide mediastinal shadow and peribronchial infiltration. Acute laryngitis with laryngeal edema was present in the more severe burns; two children required tracheotomy during the acute stage. Gastritis was so severe in three patients that pyloric stenosis developed which required a jejunostomy in two of the three and a gastroenterostomy in the third patient. In one patient, an adult who succeeded in suicidal attempt, a chemical mediastinitis and peritonitis developed from perforation of the esophagus and

stomach by the erosion of the acid he had ingested.

The acute stage generally lasts 1 to 2 weeks during which the patient is seriously ill and unable to swallow even his own saliva. Improvement in the swallowing function is seen 1 to 2 weeks after the accident, and often a complete return of full function follows in 3 to 4 weeks. Later, however, as healing progresses there is a return of dysphagia, often so gradual that it is evident only in changes in the patient's eating habits. He gradually learns to eat fewer solids, washes down each mouthful of food with water or milk, and learns to gag himself to dislodge food which becomes stuck in the stricture. It may be 5 months or 5 years before the stenosis becomes severe enough to require surgical intervention, but once a patient has swallowed lye some type of treatment will eventually have to be instituted to keep the food passage open. Tight, benign esophageal strictures of adults not infrequently are due to lye swallowed during childhood, producing obstructive symptoms only years later.

Chronic Strictures. Sixty-five, or 68%, of the patients in this series were seen because esophageal stenosis had developed which necessitated re-establishment of some method of feeding, or because of strictures or atresia of the esophagus which required dilatation. In some, complete esophageal atresia had developed as soon as a month after ingestion of the caustic. In four patients symptoms of dysphagia, which had progressed insidiously, became severe enough to require treatment from 25 to 60 years after the ingestion of the caustic.

The chronic lye stricture of the esophagus is usually extensive, with multiple strictures throughout the course of the esophagus; some are thin shelves of tissue and others long cylindrical bands of scar tissue. Complete atresia not infrequently occurs. The mucosa between strictures is usually very thin and it is in these areas that perforations most often occur rather than in the strictures themselves.

The most common sites of the chronic strictures are of special significance. In this series of patients the most severe strictures were found at the cricopharyngeus and at the cardia. It is probable that this due to the hesitation, and consequently greater burn, of the caustic above these physiologic sphincters.

Associated systemic disease was commonly found in the patients with chronic stenoses or atresias. In some patients gradually progressive stenosis was associated with severe starvation states, dehydration, avitaminosis and anemia. Two patients were found to have pulmonary tuberculosis. Dental caries is a prominent associated finding, especially in the children. Physical developmental retardation was prominent; children of 10 to 15 years of age who had swallowed a caustic in infancy, who had had gastrostomies for years because of complete esophageal atresia, appeared physically to be three to five years younger than their actual ages.

DIAGNOSIS

The diagnosis of a caustic burn of the esophagus is usually apparent from the history alone. If a patient has ingested a caustic the probability of a burn severe enough to cause a stricture is very great. The caustic burns the mouth so severely that the patient attempts to get rid of it by every means of emptying the mouth, including swallowing. Therefore, it must be assumed that a burn sufficient to produce changes in the mouth has also produced changes in the esophagus, and treatment must be directed toward that eventuality. Fluoroscopic examinations with radio-opaque media and esophagoscopy during the acute stage are contraindicated. After the acute burn has subsided, or in an attempt to detect the presence or location of a stricture at a later date, fluoroscopic and radiographic technics are of first importance. If an atresia of the esophagus exists or if dysphagia is very marked, lipiodol or other radio-opaque oils should be substituted for barium to avoid aspiration of barium into the tracheobronchial tree. In cases of complete esophageal atresia retrograde studies give information concerning the cardiac end of the esophagus. The opaque medium is introduced through the gastrostomy tube, and by placing the patient in the Trendellenberg position the barium may be observed to flow upward to outline the lower esophagus.

Esophagoscopic examination is the final diagnostic procedure and follows the roentgenographic studies. As mentioned, it is contraindicated in the acute burn because of the danger of perforation and because it can add little to what is already known—namely, that an acute

burn has occurred and severe edema is present. Strictures form later with healing and cannot be detected early.

TREATMENT

Any discussion of the treatment of lye strictures should begin with prophylaxis. Laws regarding adequate "poison" labels on lye containers exist, but they are not enforced. Lye, Chlorox, ammonia, and similar caustics should not be in the home unless absolutely necessary for some specific purpose, and then the excess should be properly discarded or placed where it is inaccessible to children. Most important, lye should never be placed in a container ordinarily used for food, since this is the most common cause of this accident.

The immediate treatment of an acute lye burn consists of the weak neutralization of the alkali by orange juice or very weak vinegar. Stronger acid solutions are caustics in themselves and should be avoided. Sedatives are indicated because of pain; symptoms of shock should be treated as they occur. Attempts to wash the stomach are dangerous because of possible perforation. Burned areas of the lips, chin and hands may be covered with olive oil and the mouth kept as clean as possible with mild antiseptic. It is generally necessary to give fluids intravenously, and a gastrostomy may have to be considered soon after the ingestion of the caustic if the burn is unusually severe.

Two courses of treatment now present themselves. Formerly dilatation of the esophagus was begun only after the acute inflammatory reaction had subsided; dilatation was then performed by esophagoscopy, retrograde technics or by olive-tipped bougies passed over a string. At present active dilatation is begun 24 to 48 hours after ingestion of the caustic, using soft rubber smooth-tipped catheter-like bougies filled with mercury. Graduated sizes from 16F to 30F for children or up to 48F for adults are inserted into the mouth, well lubricated. They advance to the stomach by their own weight. Two or three bougies are used once daily, gradually increasing the size during the first two weeks. Dilatations are then spaced twice a week for a month, then once a week for another month. Subsequent dilatations are continued at monthly intervals for a year and then the period between dilatations is increased. It is of utmost importance that the patient continue with this regime. The tragedy in most cases of esophageal strictures is that the family, and often the physician, are not aware that the return of normal or almost normal swallowing occurs after the acute edema associated with the original burn subsides. Treatment must be continued during this period of relative lack of symptoms if stricture formation is to be avoided.

Treatment of chronic caustic strictures of the esophagus presents a never-ending problem. The simplest strictures are the solitary webs that can be opened with a few esophageal dilatations to permit normal swallowing function. Such strictures should be re-examined at intervals of one to three years and dilated to avoid recurrence. Olive-tipped bougies passed over a previously swallowed string are frequently used and are an adequate means of dilating multiple strictures. "Courses" of treatment may be given over short intervals, followed by a rest period when an adequate lumen has been established.

In cases of multiple strictures of the esophagus that have necessitated gastrostomy, a swallowed string may be recovered through the gastrostomy opening. Dilatation is then most easily performed by retrograde bouginage, the bougies being attached to the gastrostomy end of the string and drawn up from below.

Twenty-seven of the patients who were seen in the chronic stage of their disease had complete atresia of the esophagus at the time of hospitalization. Obstruction was complete even to their inability to swallow their saliva. Esophagoscopic bouginage was employed both from above and from below by means of the gastrostomy opening. The procedures were controlled under biplane fluoroscopy in most instances. In five patients a Barretto needle was employed to perforate the atresic stricture after biplane fluoroscopy had demonstrated the esophageal and gastroscopic scopes to be in perfect alignment. In two patients the esophageal lumen could not be re-established and subcutaneous skin-flap tubes were constructed by Dr. John Reynolds to connect an upper esophagotomy with the gastrostomy opening.

There have been three deaths in this series. One, the infant who had been given lactic acid by accident, died after perforation of the esophagus which occurred during dilatation. This accident occurred before the present chemotherapy and antibiotics were available. This perfora-

tion developed during dilatation in the chronic stage of the stricture, not during the acute stage. The infant was first referred after the stricture had fully formed and obstruction was almost complete. The second death was due to aspiration pneumonia. A tracheoesophageal fistula developed during the course of treatment of this 8-year-old girl. Development of the fistula did not bear any direct relationship to any specific esophageal dilatation, but it is possible that the fistula was due to perforation at the time of a treatment. The third death occurred in a man who had swallowed a large quantity of "boiler fluid", a combination of sulphuric acid and hydrochloric acid. He had multiple esophageal strictures, marked destruction of the stomach and duodenum, and eventually required a jejunostomy for feeding purposes after a gastrostomy proved to be unsuccessful. Death was due to gradual inanition and had no relation to esophageal instrumentation.

Fifty-seven or 60%, of this series of patients required gastrostomy or jejunostomy during their course of treatment. The gastrostomy initially served for feeding purposes and subsequently for retrograde dilatation. The course of treatment always seemed more rapid once the retrograde technic was instituted. In multiple tight strictures this technic is considered safer than dilatation from above.

The most important single fact demonstrated by a review of this series of 96 patients is that once the accident of caustic ingestion has occurred, continuous and repeated treatment is necessary to avoid stricture development. If the stricture is successfully treated and normal swallowing function is restored, occasional treatment must be administered to prevent recurrence of stenosis. Multiple gastrostomies were required in 6 patients. Four were children whose parents failed to keep appointments after dilatation had proceeded satisfactorily, swallowing function had been restored, and the original gastrostomy closed. Two were adults who had swallowed the caustic in unsuccessful suicide attempts. They were uncooperative through all treatment. One of the two died following an attempted esophageal resection.

Resection of the strictured portion of the esophagus and anastamosis of the stomach to the residual proximal esophagus has recently been advocated with considerable success. In solitary strictures near the cardia this has considerable value. However, strictures usually are multiple, and often the most resistant stricture lies at the level of the cricopharyngeus, making it almost impossible to resect all the pathology. Consequently, it has been necessary to continue dilatations in some patients who have been resected, either dilating the high stricture or the stricture that has developed at the point of anastamosis.

SUMMARY

An analysis of 96 consecutive cases of caustic burn of the esophagus has been presented. An analysis of the types of caustic agent ingested, the age groups, sex, and race incidence is given in Table I. Most cases occur in children and are accidental, the caustic being placed in a container ordinarily used for food or drink — a glass, cup, Coca-cola bottle, etc. Acute burns constituted approximately 1/3 of the patients while the remaining 2/3 were first examined only after multiple strictures had developed. Most significant is the recent change in the management of the acute burn, beginning dilatation within 24 hours of the accident by means of soft rubber mercury-filled bougies. No strictures have developed in the patients so treated during the three years this treament has been used, and no complications such as esophageal perforation have developed. Once a caustic has been swallowed, dilatation or some form of esophageal examination must be continued throughout the life of the patient at increasing intervals. Failure to continue management when swallowing function is restored, either initially or in later years, results in cicatricial contracture of the severest type for which gastrostomy, multiple dilatations, or esophageal resection may have to be done.

Clinical Implications of Growth

Julius B. Richmond, M.D.
Professor of Pediatrics
University of Illinois

SEMINAR
of the
Department of Medicine
and
Cooperating Departments
of
The University of Illinois
Edited by:
Max Samter, M.D.
William R. Best, M.D.

Dr. J. B. Richmond Associate Professor of Pediatrics: I am grateful for this opportunity of discussing with the members of the Department of Medicine some of the problems of the clinical implications of growth. Since both of our specialties are "medical" in character, we search for distinguishing features. Growth is the major factor which distinguishes our patient from the adult medical patient. While the whole subject of growth is too vast to be considered in any comprehensive fashion during one brief seminar, we can discuss some clinical conclusions which are based on specific changes with which growth is associated. I might say parenthetically that in pediatric departments today, as much as fifty percent of teaching time is devoted to considerations of growth and development in some form or other.

To orient ourselves, it is well to review for a moment Scammon's classic representation of the growth of the body and some of its constituent tissues (Figure 1). These curves demonstrate that the young organism is not a "miniature adult" but shows both qualitative and quantitative differences from the mature organism. The rate of growth of the body as a whole is most rapid in infancy and during adolescence. The importance of an adequate dietary intake of all necessary food factors during infancy has been well appreciated for some years. It has been demonstrated, for instance, that the clinical appearance of scurvy or rickets during infancy, as a result of vitamin C and D deficiency respectively, is enhanced by the rapid growth which characterizes this period of life. Johnston has recently emphasized that inadequate vitamin D and/or calcium intakes concomitant with rapid growth may produce clinical manifestations such as slipped epiphysis and epiphysitis during adolescence. Some unreported studies of ours indicate that subclinical vitamin deficiencies during adolescence may be considerably more frequent than is generally appreciated. The increased cellular activity associated with rapid growth makes metabolic demands which should be respected. Recent studies by Albright suggest, as a matter of fact, that inadequate pro-

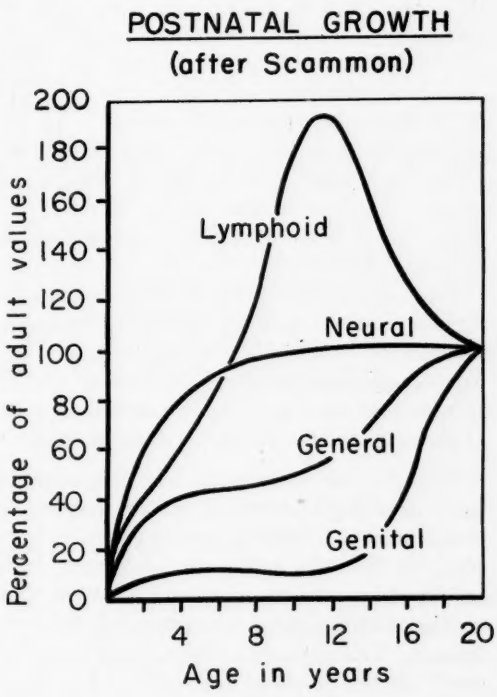

Figure 1

tein intake may have a definite bearing on the extent of damage caused by vitamin deficiencies.

Further inspection of these curves reveals that central nervous system growth is rapid and almost complete in early life. Although the total number of neurons is present at birth, recent work has indicated that synapses have not necessarily entirely established themselves. This may, in part, explain the adaptability of the central nervous system in early life. Lymphoid tissue, it may be noted, undergoes rapid growth in early life and attains a total mass greater than that ultimately observed in the adult. I would like to mention only one facet of this observation: its relation to tonsillectomy. Tonsils are physiologically large during childhood; size alone should never become an indication for tonsillectomy unless specific symptoms result. It is significant that several years ago the Child Health Association conducted a survey in which a group of children were examined by several physicians. Recommendations for tonsillectomy progressively increased as the number of examining physicians increased.

Disease processes may influence growth generally or locally. Dean Brodie and Dr. Engel of the Department of Orthodontia have been involved in quantitative studies of cranio-facial growth for some years. For the past two years their techniques have been applied to the study of children with rheumatoid arthritis. In approximately 20 percent of our cases, we have observed significant retardations of mandibular growth resulting, to some degree, in micrognathus. These have often been misdiagnosed as congenital deformities in the past. Since growth of the mandible takes place by endochondral bone formation at the condyle, apparently temproromandibular arthritic involvement—when it occurs—causes cessation of growth. It is interesting to note that there is little dysfunction in spite of the cosmetic disturbance in these patients.

We have, for some time, been interested in some physiologic aspects of growth relating to renal function. Although nephrogenesis is complete by the 35th fetal week, glomerular tufts are lined by cuboidal or columnar rather than squamous-epithelium in premature and full term infants. This probably is the cause of immature renal function values as demonstrated by various studies when contrasted to the adult even when adjusted to body weight or surface area standards. Thus inulin clearance values as measurements of glomerular filtration rate are approximately half the adult value when adjusted to the same surface area; similar observations have been made of renal plasma flow or maximal tubular excretion as determined by PAH clearance studies. These studies have considerable clinical significance. The young infant can get along satisfactorily until difficulty arises. He can't clear electrolytes or any other load which may be thrown on his renal excretory mechanism as efficiently as the older child. Thus fluid and electrolyte administration during early life require careful consideration which takes account of these physiologic limitations. We have observed renal phosphate clearance in newborn infants to be considerably lower than values obtained in older subjects. This, combined with the relatively high phosphorus content of undiluted cows milk feedings may contribute in some instances to the development of neonatal tetany. Phosphate clearances in infants older than one month are considerably improved; this may in turn be linked to improved parathyroid function.

In some studies we have done, we have applied this information in therapy. By administering one-half grain of a sulfonamide mixture per pound of body weight subcutaneously once every 24 hours in infants under two months, we have maintained adequate therapeutic sulfonamide blood levels. In infants over two months renal function was sufficiently mature so that the results were not nearly so constant. With penicillin therapy, Barnett and others have shown that it is also possible to administer doses at less frequent intervals than is generally recommended for older individuals and still maintain satisfactory blood levels. These limitations of renal function probably explain, in part, the tendency for the development of salicylate intoxication, predominantly in infants.

We may even think of growth in terms of biochemical reactions. It has been well demonstrated that the premature—and to a certain extent the full term—infant is not capable of metabolizing tyrosine as well as the mature organism. It has also been observed that ascorbic acid, and to a certain extent, folic acid can eliminate this metabolic "defect." Further studies will some day elucidate the "growth" of

biochemical processes probably in terms of enzyme systems.

One might even speculate that most of our future information concerning growth of the fundamental unit—the cell—will some day come from studying disordered growth in the form of neoplastic disease. Folic acid antagonists are an example of such recently acquired experimental tools. They convert dysplastic bone marrow of acute stem cell leukemia to mature marrow. While these tools do not yet cure the disease (although they have increased survival time in many instances) they might lead the way to a better understanding of disordered cellular metabolism and subsequently to more effective therapeutic agents. I am certain that studies of molecular structure of normal and abnormal enzyme systems will eventually solve the problems of growth which represent a joint project for the biochemist and the clinician.

DISCUSSION

Dr. Max Samter, Assistant Professor of Medicine: Of the diseases of infancy, atopic dermatitis—with some exceptions—seems to be limited to a definite period of the infant's life. In many cases it begins shortly after birth, persists to from eighteen to twenty-four month, then clears spontaneously. What are the changes of growth which take place during this particular period of life and how could they be related to the change in the incidence of atopic dermatitis?

Dr. Richmond: This is too big a problem to be explained by facts now known. We might conjecture that it is related to subtle aspects of endocrine maturation which affect the skin. It is known that the adrenal undergoes considerable involution shortly after birth. Since ACTH and compound E have been studied, the role of the adrenal in allergy has become more evident. It is possible that many adrenal insufficiencies during the first year of life go unrecognized. They may be manifested merely as vomiting or a failure to thrive normally. Other possible mechanisms include a more permeable gastrointestinal tract or too rapid increase in the diet. We believe the gastrointestinal tract becomes less permeable with increasing age. I wish I could answer your question more adequately since atopic dermatitis is one of the greatest headaches of pediatric practice.

Dr. Ford Hick, Professor of Medicine: Is there a qualitative difference in temperature regulation in children?

Dr. Richmond: Diurnal temperature variation is not well established until near the end of the first year. We do not know why.

Dr. Robert W. Keeton, Professor of Medicine: Is the surface areas reliable metabolic guide in the years from two to six?

Dr. Richmond: It does appear to correlate better than any other guide with the possible exception of creatinine excretion which is a more accurate reflection of muscle mass as proposed by Talbot.

Dr. Samter: I am not certain whether this question is based on correct reasoning but I have often wondered why malignancies appear to be uncommon in infancy even though growth in general is stimulated.

Dr. Richmond: Malignancies have become an increasingly important problem in pediatrics. Whether the increase is more apparent than real we don't know. It may be that with lower mortality rates as a result of better infant care and control of infectious diseases more children are surviving to develop neoplasms. Hence, there may be an absolute increase. At the Boston Childrens Hospital recently 3½% of autopsies have demonstrated malignant tumors.

CASE RECORDS OF THE COOK COUNTY HOSPITAL

KARL MEYER, LEO M. ZIMMERMAN, DEPT. EDITORS

An Unusual Case of Gallstone Ileus

I. F. Stein, Jr., M.S., M.D.*, and Karl A. Meyer, M.D., F.A.C.S., F.I.C.S.**
Chicago

The patient was a 47 year old white female who was admitted to the hospital on February 16, 1950 with the following complaints: vomiting—four days; abdominal pain—four days; no passage of flatus or bowel movement—four days.

On February 12, 1950 after eating a small lunch the patient had a gradual onset of upper abdominal and periumbilical cramping pain, followed by nausea and vomiting. During the next four days the patient vomited whenever she attempted to eat, and continued to have frequent episodes of abdominal pain. This cramping pain lasted for a few minutes and was accompanied by borborygmus. She had not passed gas nor had a bowel movement in four days.

The patient had pulmonary tuberculosis in 1930 and was in a sanitarium for a year and a half after which she was asymptomatic until two years ago, when she developed malaise, loss of weight and a cough. She was told that her tuberculosis had become active, but refused hospitalization and remained at home in semi-isolation.

During the past few years she had occasional attacks of upper abdominal pain associated with vomiting. These episodes usually lasted one or two days.

In 1926 she was operated upon for appendicitis, and was told after surgery that she also had salpingitis.

Physical examination revealed a thin, moderately dehydrated, white female who appeared acutely ill. There were moist rales, tubular breath sounds and dullness to percussion in the left upper lung. The abdomen was soft and flat with slight tenderness in the right upper quadrant. The bowel sounds were infrequent but of a high pitched tinkling character when present. There was a lower abdominal midline scar.

The rectal temperature was 99.0°F., the pulse 120 and the respirations 18. The blood pressure was 110/80.

Examination of the blood revealed an erythrocyte count of 4,500,000 with a hemoglobin of 80% and a leukocyte count of 12,000. The Kahn test and the urine were negative. An x-ray of

*Chief Surgical Resident, Cook County Hospital; Solomon Fellow and Research Associate, Hektoen Institute for Medical Research; Clinical Assistant in Surgery, Northwestern University Medical School.

**Chairman of the Department of Surgery, Cook County Hospital; Professor of Surgery, Northwestern University Medical School.

Figure 1. Barium enema showing diverticulosis in descending and sigmoid Colon.

Figure 2. Barium meal showing cholecystoduodenal fistula and distended jejunum.

Figure 3. Twelve hours after Barium meal showing complete jejunal obstruction.

the abdomen showed a moderate amount of gas, but no definite pattern. Barium enema revealed diverticulosis in the descending and sigmoid colon. Figure 1.

The patient was given 60cc. of mineral oil by mouth after the stomach had been emptied. Intravenous fluids were administered and later continuous intragastric suction was started.

On the following day, February 17, 1950, the x-ray of the abdomen was unchanged. She passed a small amount of gas, but continued to vomit in spite of the functioning Levin tube. On February 18th, the temperature was 98.0°F., pulse 80, and respirations 20. Abdominal cramps continued and she passed gas on two occasions. On the 19th, the patient had an episode of right upper quadrant pain and vomiting. There was moderate tenderness in the right upper abdomen which had subsided on the 20th. The patient had a bowel movement on the 21st and the Levin tube was removed. On the following day the patient began vomiting again and the Levin suction was restarted. On the 23rd, she had a watery light brown stool and complained of pain throughtout the right side of the abdomen. The condition was essentially unchanged on the 24th. The patient was having small infrequent bowel movements some of which contained mineral oil. There was, however, a slight increase in abdominal distention and tenderness. It was suggested at this time that a swallow of contrast medium (Umbrathor) be given in an attempt to arrive at a definite diagnosis.

On February 25, 1950, by mistake, she was given a barium meal. We saw the patient, for the first time, twelve hours after the administration of barium. Serial films were available at this time which showed: 1) a small diaphragmatic hernia, 2) an irregular filling defect to the right of the first portion of the duodenum, (Figure 2) 3) several markedly distended loops of jejunum filled with barium, and 4) complete obstruction of a loop of jejunum on the left side of the abdomen, beyond which no barium had passed in 12 hours. (Figure 3.)

The patient was transferred to our surgical service and operated upon without delay. Under spinal anesthesia an upper left rectus incision was made. A small amount of serious exudate was present in the peritoneal cavity. A distended loop of jejunum presented which lead to the right to an area of tuberculous peritonitis. There were numerous caseous tubercles on the bowel and mesentery, but no obstruction in this area. On following this distended loop to the left, a solid object was encountered within the lumen of the jejunum. The bowel was opened and a gallstone measuring 5 x 4 x 3½ cm. was removed. Further brief exploration revealed 1) an inflammatory mass in the region of the gall

bladder involving the omentum, duodenum and hepatic flexure of the colon; 2) sigmoid diverticulosis without any evidence of adhesions or inflamation; 3) several adhesions of the omentum to the old lower abdominal scar. Nothing was done other than the removal of the gall stone and closure of the bowel.

The post-operative course was uneventful. The patient was given penicillin, 100,000 units every three hours and streptomycin, 1 gm. every six hours, for forty-eight hours after which she became afebrile and the dose of these drugs was reduced. She had a large bowel movement twelve hours after surgery, followed by diarrhea for two days. The skin sutures were removed on the 10th post-operative day at which time the wound was completely healed. In view of the tuberculous peritonitis, the patient was advised to have streptomycin therapy for two months. She did not wish to follow this advice and signed her release, leaving the hospital on the 12th post-operative day, at which time she was asymptomatic.

DISCUSSION

This case is unusual from several aspects. There was a multiplicity of lesions: 1) Bilateral pulmonary tuberculosis with unilateral cavitation 2) tuberculous peritonitis 3) adhesions to the old abdominal incision 4) diverticulosis 5) diaphragmatic hernia 6) pericholecystic phlegmon with cholecysto-duodenal fistula and 7) gallstone ileus. Any of the last six conditions could have produced the symptoms. The favored diagnosis, before the barium meal showed a complete small bowel obstruction, was tuberculous peritonitis, thus non-operative treatment was employed, for this condition rarely causes complete bowel obstruction. When it was ascertained that the patient did have a complete bowel obstruction, immediate surgical intervention was employed, for there had already been a long period of conservative therapy and the obstructed loop was filled with barium which could only be removed by the alleviation of the obstruction.

The x-ray films are of particular interest. The irregular filling defect to the right of the duodenum (Figure 2) probably represents barium which has gone through the cholecystoduodenal fistula, thus visualizing either the gall bladder or part of the common duct. The valvulae conniventes or plicae circulares of the small bowel (and particularly the jejunum) are often seen in small bowel obstructions due to the filling of the obstructed loops with gas. It is most unusual to see these structures and the obstructed loops, as clearly as is shown on the films. We wish to emphasize that this patient was given oral barium by mistake, and that a barium meal is contraindicated in cases of bowel obstruction. The severity of the obstruction will become increased particularly if the barium solidifies. In addition if the intestine is opened and barium escapes into the peritoneal cavity, fatal peritonitis often results.

Finally, gallstone obturation usually produces obstruction of the middle or terminal ileum and it is unusual for such a large stone to erode into the intestine and obstruct the upper jejunum.

SUMMARY

A case has been presented of high intestinal obstruction due to gallstone obturation, complicated by bilateral tuberculosis, tuberculous peritonitis, and phlegmonous cholecystitis with cholecystoduodenal fistula. Additional non-complicating factors were a diaphragmatic hernia, sigmoid divertculosis, and multiple adhesions to a preexisting abdominal incision.

CASE REPORTS

Treatment of Severe Infectious Mononucleosis with Aureomycin

Paolo Ravenna, M.D.
Chicago

In recent years it has been discovered that infectious mononucleosis is a serious illness. The occurrence of edema of the larynx was described by Ravenna and Snyder[1] and a fatal outcome from laryngeal edema was reported shortly afterwards by Custer and Smith[2]. Neurological complications, including the Guillain-Barré syndrome, bulbar paralysis and encephalomyelitis have been recorded in previous years (Epstein and Dameshek[3]) and more often recently (Landes, Reich and Perlow[4]; Geliebter[5]; Ricker, Blumberg, Peters and Widerman[6]; Dolgopol and Husson[7]; and others). Rupture of the spleen and its fatal outcome has been mentioned often (Ziegler[8]; Fisher[9] and others), and hepatitis has been diagnosed in a disturbingly high percentage of cases (DeMarsh and Alt[10]; Bang and Wanscher[11]; Peterson[12]; Evans[13]; Sterling[14]).

Reliable recent statistics on the incidence of and mortality from infectious mononucleosis and its complications are not available. There is little doubt but that the prognosis is not as uniformly excellent as was believed less than ten years ago[15]. The recent reports of distressing complications may be due to an increase in morbidity or in severity as well as to more common recognition of the disease. It is clear, however, that infectious mononucleosis can no longer be regarded with complacency in every case.

The treatment of infectious mononucleosis has been confined to the supportive and symptomatic care as a result of the lack of favorable action of the sulfa drugs and of penicillin and streptomycin. Some hint that aureomycin may benefit has appeared in the literature (Dowling and co-workers[13]), but seems contradicted by others (Rose and Kneeland[14]).

This is the report of a case in which aureomycin was used in the treatment of a severely ill patient and it is my impression that it proved beneficial.

A robust twenty year old white student began

From the Dept. of Medicine, University of Illinois College of Medicine.

to complain of malaise and sore throat on September 18, 1949. The following day his temperature reached 100°F and the only abnormality was a uniformly inflamed throat with several small plaques scattered over both tonsils. Regional adenopathy was slight. He received 300,000 U. of procaine penicillin in oil. A throat culture for diphtheria was taken and reported negative.

The fever continued with a remittent curve with a maximum of 102.6° F and the malaise increased. The patient became restless, nauseated, vomited repeatedly, and complained of pain in the right upper quadrant of the abdomen. He felt and appeared severely ill. The exudate in the throat became confluent and on September 21 covered both tonsils completely. The cervical adenopathy increased considerably and marked enlargement of the axillary and inguinal nodes was noted. The spleen was clearly palpable and tender and the liver edge was felt 5 cm below the costal margin and was round, soft and tender.

Administration of aureomycin was started in the evening of September 21. One capsule (250 mg) was given every hour for twenty doses, followed by one capsule every three hours until September 26. The total amount administered was 12 Gm.

Twenty-four hours after the beginning of aureomycin treatment the temperature dropped to 99.6°F and the patient felt much better. The vomiting stopped, the nausea subsided and the throat was less sore. The swelling of all superficial lymphnodes had increased further by then and the liver reached to 7 cm and the spleen to 6 cm below the costal margin.

Thirty-six hours after aureomycin was started, the temperature was normal and remained normal thereafter. The following day the throat was almost clear and the lymphnodes, the spleen and the liver were not tender and much smaller in size. On September 26 the patient had apparently recovered: the spleen and liver were not palpable and the lymphnodes had regressed to normal size. The patient was kept at bed rest, against his strenuous objections, for another ten days and returned to his normal activities.

The significant blood findings are summarized in the table. The urine was normal throughout the illness except for a transitory slight albuminuria during the febrile period.

TABLE

Date of test	Blood Total W.B.C. x 1000	Lympho-cytes per cent	Hetero-phile antibody titer	Cephalin Flocculation	Thymol turbidity (units)	Van-den Bergh Direct	Total bilirubin mg per 100 cc
9/22/49	19.5	75	over 1792	+++	8	neg.	0.3
10/5/49	10.4	72	896	neg.	14	neg.	0.4
10/14/49	7.5	44	—	—	—	—	—
10/24/49	6	42	112	neg.	4	neg.	0.4

COMMENT

There can be no doubt but that the case reported here was one of severe infectious mononucleosis complicated by hepatitis. The nausea and vomiting, the pain in the right upper quadrant of the abdomen and the enlargement and tenderness of the liver are evidence of hepatic involvement. In similar cases jaundice frequently appears and there is a protracted and severe course followed by a long convalescence[18]. Instead, within twenty-four hours after the administration of aureomycin was started, the fever dropped and in four days all the clinical manifestations of the disease had cleared up completely. The cephalin flocculation was negative two weeks later and the thymol turbidity returned to near normal limits in four weeks.

This case supports the contention that aureomycin may be effective in the treatment of infectious mononucleosis. The discordant opinions which have appeared in print so far may be explained by either inadequate dosage or the possibility that infectious mononucleosis may be due to more than one agent or strain, of varying sensitivity to aureomycin. It should also be noted that equivocal results may be observed because of the extremely variable clinical course, which makes it difficult to evaluate the action of any drug. Obviously the best information can be obtained from acutely and severely ill patients, when one can safely predict a course of several weeks. It is for this reason that this case is reported, as it seems more informative than a series of patients either mildly ill or diagnosed after the peak of the illness.

Addendum: A study on Aureomycin in Infectious Mononucleosis (M. H. Seifert, V. L. Chandler and W. Van Winkle, Jour. A.M.A.

142: 1133 (Apr. 15, 1950) appeared after the present report was submitted for publication. It shows that the grouping together of cases of diverse duration and severity makes the evaluation of results more difficult. In addition, the administration of smaller initial amounts of the drug may be responsible for the apparently unsatisfactory results reported by these authors.

SUMMARY AND CONCLUSIONS

1. Infectious mononucleosis may assume a severe, prolonged and even fatal course.
2. The administration of aureomycin in a severe case complicated by hepatitis was followed by improvement within twenty-four hours and by apparent recovery in four days.
3. It is believed that aureomycin is effective in at least some cases of infectious mononucleosis. Failures may be due to insufficient dosage or to a special resistance of some of the strains of the still unknown agent of the disease.

104 S. Michigan Ave.

REFERENCES

1. Ravenna, P. and Snyder, J. The occurrence of edema of the pharynx and larynx in infectious mononucleosis, Annals Int. Med. 28: 862, Apr. 1948.
2. Custer, R. P. and Smith, E. B., The pathology of infectious mononucleosis, Blood 3: 830 (Aug.) 1948.
3. Epstein, S. H. and Dameshek, Wm.: Involvement of central nervous system in a case of glandular fever, New England J. Med. 205: 1238, 1931.
4. Landes, R., Reich, J. P. and Perlow, S. Central nervous manifestations of infectious mononucleosis, Jour. A.M.A. 116: 2482, May 31, 1941.
5. Geliebter, S.: Acute infectious mononucleosis complicated by encephalomyelitis, Lancet 2: 753, Nov. 23, 1944.
6. Ricker, W.; Blumberg, A.; Peters, C. H. and Widerman, A. The association of the Guillain-Barré syndrome with infectious Mononucleosis, with a report of two fatal cases, Blood 2: 217 (May) 1947.
7. Dolgopol, V. B. and Husson, G. S.; Infectious mononucleosis with neurologic complications, Arch. Intern. Med. 83: 179, Feb. 1949.
8. Ziegler, E. E. Infectious mononucleosis: Report of a fatal case with autopsy, Arch. Path. 37: 196, 1944.
9. Fisher, J. H. Visceral lesions of acute infectious mononucleosis: a report of two cases with fatal spontaneous rupture of the spleen, Amer. J. Path. 23: 463, 1947.
10. DeMarsh, Q. B. and Alt, H. L., Hepatitis without jaundice, in infectious mononucleosis Arch. Int. Med. 80: 257 (Aug.) 1947.
11. Bang, J. and Wanscher, O. The histopathology of the liver in infectious mononucleosis complicated by jaundice, investigated by aspiration biopsy, Acta med. Scand., 120: 437, 1945.
12. Peterson, R. E., Hepatic dysfunction in infectious mononucleosis, Jour. Lab. & Clin. Med. 33: 1258, 1948.
13. Evans, H. S., Liver involvement in infectious mononucleosis J. Clin. invest. 27: 106, 1948.
14. Sterling, K. Serum proteins in infectious mononucleosis, electrophoretic studies, J. Clin. Invest. 28: 1057, Sept. 1949.
15. Bernstein, A., Infectious mononucleosis, Medicine, 19: 85, 1940.
16. Dowling, H. F., Lepper, M. L.; Caldwell, E. R.; Whelton, R. L. and Sweet, L. K., Aureomycin in various infections: report of one hundred eighty cases and review of the literature, Med. Ann. of the District of Columbia 18: 335, July 1949.
17. Rose, H. M. and Kneeland, Y. Jr., Aureomycin in the treatment of infectious diseases, Amer. J. Med. 7: 532 (Oct.) 1949.
18. Marie, J. and See, G., Mononucléose infectieuse avec volumineuse hépatosplénomégalie et quatre echutes febriles, Bull. Soc. Méd. D. Hop. Paris 65: 194, Feb. 25, 1949.

SURGERY IN COLITIS

Nowhere in the field of surgery is careful surgical judgement and consultation between the surgeon and the internist more imperative than in the treatment of ulcerative colitis. Most operative procedures, especially in the fulminating cases, must be staged, beginning with the simplest procedure (usually ileostomy), and followed step by step, as the condition of the patient warrants it, by partial colectomy or complete colectomy. *Excerpt: Surgical Treatment of Ulcerative Colitis, William S. McCune, M.D., assistant clinical professor of surgery, George Washington University School of Medicine, Med. Annals of the Dist. of Columbia, Aug. 1950.*

Electrocardiographic Changes in Infectious Mononucleosis

W. F. Boehm, M.D., W. R. Rose, M.D., and H. N. Barnes, M.D.
Chicago

As data on infectious mononucleosis accumulate, the protean nature of the disease becomes more apparent. Myocardial changes associated with this illness have been described by several investigators. The purpose of this paper is to report a case of infectious mononucleosis, during the course of which EKG changes, corresponding to those seen in acute pericarditis, were present.

Custer and Smith[2], in a system-by-system analysis of autopsies on eight patients who died of infectious mononucleosis, noted myocardial changes in six cases. The changes consisted of aggregates of lymphocytes sparsely distributed within the myocardium in the periphery of the smaller vessels. Round cells were also present in small numbers beneath the endocardium. No actual necrosis was noted and no real pericarditis was encountered. They cite Jersild's case in which an autopsy diagnosis of death from myocarditis, due to infectious mononucleosis, was established. Dolgopol and Husson[3] found moderate edema of the myocardium, with loss of striation in a few fibers, at necropsy on a fatal case of infectious mononucleosis with neurological complications.

Caudel and Wheelock[1], in describing nonspecific myocarditis, reported a case of infectious mononucleosis in which T wave changes were noted in serial cardiograms for a period of a few days. Jaffe, Field and Master[8] obtained EKGs on 22 patients with infectious mononucleosis, and found significant deviation in nine of these. Lowering or inversion of T waves were the characteristic changes. Significant Q waves, QRS abnormalities, or ST segment deviations were not found. They did not find clinical evidence of active carditis in any of these patients. Evans and Greybiel[4] reported four cases of infectious mononucleosis with T wave changes consisting primarily of lowering of the T waves, and, in one instance, inversion of T4. These abnormalities persisted from six to 41 days. Geraghty[5] described a case of infectious mononucleosis in a 14 year old boy, in which T changes were noted. The abnormalities did not disappear within a period of one month. Gloyne[6] reported a case with transient EKG changes resembling those found in pericarditis, but because of the disappearance of T wave changes in five days or less, he felt that the changes were more probably due to myocarditis with rapid repair.

Case Report: The patient, D. B., is a 17 year old white male high school student. Except for mumps and measles in early childhood, past history was negative.

On April 22, 1949, he engaged in strenuous physical exercise (41 consecutive "push-ups"). That day he was exhausted, and during the following week he "did not feel up to par." He states that he was weak and tired, and that he had an occasional "dizzy spell."

He awoke from sleep at the usual hour on the morning of April 29, and immediately became aware of pressing substernal pain which radiated to and down the left arm, and was severe enough to cause him to "break out in a sweat." His mother took his temperature at that time and found it to be 102°. A hot water bottle was applied to his chest, and at the end of one hour the pain had subsided. Next morning it recurred in milder form, and was rather promptly relieved by heat. The pain has not returned. However, his temperature continued to fluctuate, ranging from 98.6° in the morning to 102° at night.

On May 4 he was seen by one of us (W. F. B.). Physical examination on that date revealed a slight reddening of the nasal and pharyngeal

From the Medical Service, Lutheran Deaconess Hospital, Chicago, Illinois.

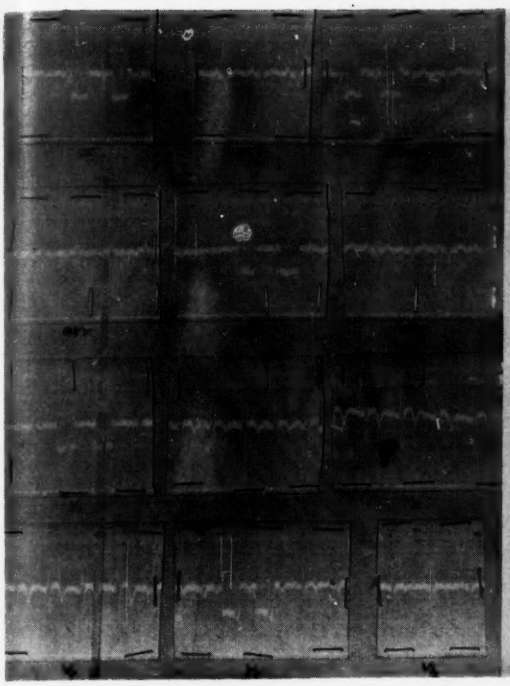

Figure 1

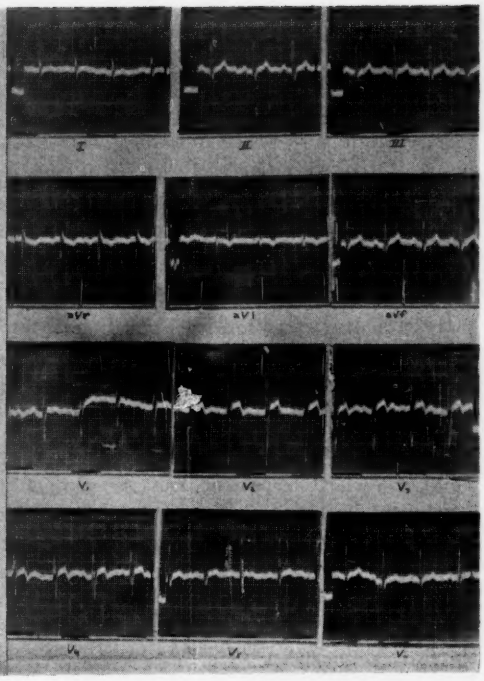

Figure 2

mucosa, moderately enlarged posterior cervical, inguinal and left epitrochlear lymph nodes, and no other abnormalities. A blood smear, taken at home, revealed 20% atypical lymphocytes, 64% small lymphocytes, and 16% polymorphonuclears.

He received 300,000 units of penicillin in oil daily for one week. His temperature continued to fluctuate, reaching 104° on two nights. This was associated with slight malaise. On May 9 and 10 he was afebrile, but next day his temperature rose to above 100°. On that day he complained of sore throat, but noted that the malaise had disappeared. Penicillin injections were renewed on the 13th and continued until the end of May. He entered the Lutheran Deaconess Hospital, Chicago, on May 15.

Physical examination on admission revealed a well developed and nourished, 17 year old white male who did not appear acutely or severely ill. Temperature was 99.8°. His pharynx was moderately injected. The cervical, axillary and inguinal lymph nodes were enlarged up to two cm., firm and non-tender. On percussion the heart was not enlarged. There was increased dullness to percussion over the splenic area, and on abdominal palpation left upper quadrant tenderness was noted, but the spleen could not be felt. The remainder of the examination was not contributory.

Blood studies on admission revealed a white blood count of 10,000, with 26% atypical lymphocytes, 50% small lymphocytes, 10% large lymphocytes, 14% polymorphonuclears, and a heterophile antibody titer of 1/1280 (eight days later the titer had risen to 1/2540). Sedimentation rate was 10 mm/hr. (Cutler). A chest x-ray revealed slight prominence of the outline of the right heart. Urine and red blood counts revealed no abnormalities.

Because of the history of chest pain, an electrocardiograph was obtained on May 17 (Figure 1). It showed coving of ST1, aVL, V2, V3, V4, V5 and V6, with inversion of the corresponding T waves, and depression of ST aVR with a diphasic T aVR. There were no abnormal Q waves. This pattern corresponds to that of pericardial lesions.

With this presumptive evidence of pericarditis at hand, the patient was reexamined several times daily throughout his hospital stay in an effort to detect a friction rub or signs of cardiac

enlargement, but no such findings could be elicited.

Serial tracings were obtained at approximately 48 hour intervals. These showed no significant changes until May 31 (Figure 2), when a lessening of the elevation and coving of the involved ST segments was seen. T1, V2, V3 and V4 were diphasic, and T V5 and V6 were upright. Subsequent tracings showed a gradual return toward the normal.

Hospital treatment consisted of bed rest, penicillin in oil, and chloromycetin, in an initial dose of 1000 mg. on May 17, then 250 mg. every four hours for 48 hours, and finally 250 mg. every six hours for eight days.

Subjectively the patient had no complaints throughout his stay. A low-grade fever persisted until May 21. The enlarged lymph nodes diminished markedly in size. On the last day of hospitalization the sedimentation rate was 6 mm/hr.; the white count was 5,900, with 1% atypical lymphocytes. He left the hospital on June second.

Since then his activity has gradually been increased. Subsequent white counts were within the normal range, and heterophile antibody titer fell to 1/320. On July 14 a normal cardiogram was obtained.

DISCUSSION

The EKG changes described are not specific. Similar alterations may appear in acute pericarditis, acute anterior myocardial infarctions, or, less likely, in coronary insufficiency. However, the absence of Q waves, the lack of clinical evidence, the age of the patient, the atypical changes revealed in serial electrocardiograms, and the eventual return of the EKG picture to normal, all militated against the possibility of infarction. Coronary insufficiency was not tenable for the same reasons.[7, 10, 11]

The possibility remained that they might have been due to non-specific myocarditis involving particularly the subepicardial layers of the heart muscle; the consensus of opinion among those who have reported cases of cardiac involvement is that toxic myocarditis is responsible for the changes. This type of involvement can produce similar EKG changes, but they are usually confined to one or two of the chest leads. The widespread changes noted in our case—from V2 through V6 (i.e., almost the entire anterior and lateral surface of the heart)—is not in keeping with such a lesion.[8] The changes associated with non-specific myocarditis are usually more transient, completing their evolution within a few days,[1] while a normal tracing was not obtained in our case until July 14, two months after the first EKG had been taken and ten weeks after the onset of symptoms. In the cases previously reported, abnormalities of the ST segments were either insignificant or entirely absent;[9] in our case, ST changes were marked and persistent.

Failure to detect a pericardial friction rub does not rule out pericarditis. A friction rub may be transient and easily missed; autopsies on patients who succumb to myocardial infarctions reveal evidence of pericarditis much more frequently than could be predicted on the basis of rubs heard during the course of the illness. Moreover, our patient did have episodes of substernal pain; because of these the first EKG was obtained.

Enlargement of the cardiac shadow, of any great extent, is the exception, rather than the rule, in pericarditis of the acute benign type.

A final diagnosis has not been established in this case. The EKG changes alone could not be considered sufficient for the purpose, and other clinical and laboratory methods of approach failed to yield positive evidence either of pericarditis or myocarditis. However, in the opinion of the authors, the findings described suggested an episode of acute benign pericarditis, occurring as a complication of infectious mononucleosis.

Assuming this to be the case, it is possible that a dual etiology existed, i. e., that the patient suffered from infectious mononucleosis, and, concurrently, from an independent acute benign (viral) pericarditis. In view of the close parallel between the course of the primary disease as manifested by clinical and laboratory findings, and the EKG changes, and because of lack of supporting evidence for a dual etiology, this possibility was considered remote.

At present the scarcity of published data would seem to indicate that the occurrence of pericarditis as a complication of infectious mononucleosis is rare. As more cases of the latter disease are recognized, closer clinical and electro-

cardiographic studies may throw more light on this subject.

SUMMARY

A case is presented in which an attack of infectious mononucleosis in a 17 year old boy was accompanied by an episode of chest pain. An electrocardiogram revealed coving of ST 1, aVL, V2, V3, V4, V5 and V6, with inversion of the T waves in the same leads. Serial EKGs showed gradual disappearance of these changes, and within a period of two months a normal tracing was obtained.

The configuration, duration and eventual disappearance of these changes correspond to the electrocardiographic pattern seen in acute benign pericarditis.

REFERENCES

1. Caudel, S., and Wheelock: Acute Non-Specific Myocarditis: Ann. Int. M. 23: 309, 1945.
2. Custer, R. P., and Smith, E. B.: Pathology of Infectious Mononucleosis: Blood 3: 830, 1948.
3. Dolgopol, V. B., and Husson, G. S.: Infectious Mononuclosis with Neurological Complications, Report of Fatal Case: Arch. Int. M. 83: 2, 1949.
4. Evans, W. F., and Graybiel, A.: Electrocardiographic Evidence of Cardiac Complications in Infectious Mononucleosis: Am. J. M. Sc. 211: 220, 1946.
5. Geraghty: Heart Complications in Infectious Mononucleosis: South. M. J., 1946.
6. Gloyne, H. F.: Case Report: Am. Pract. 3: 10, 1949.
7. Goldberger, E.: Unipolar Lead Electrocardiography: Lea and Febiger, 1947.
8. Personal Communication from Dr. Benjamin Hilkevitch, Assistant Professor of Clinical Medicine, University of Illinois.
9. Jaffe, H. L., Field, L. E., and Master, A. M.: The Electrocardiograph in Infectious Mononucleosis: N. Y. State M. J. 48: 1382, 1948.
10. Katz, L. N.: Electrocardiography: Lea and Febiger, 1941.
11. Maher, C. C., and Wosika, P. H.: Electrocardiography, Williams and Wilkins, 1940.

ARE YOU A CITIZEN?

Dr E. O. Swartz, president of the Ohio State Medical Association, recently wrote of an experience which is worth repeating:

"Not long ago, one of my patients — a fellow who always has taken an active interest in community affairs — asked me, jokingly: 'Doctor, are doctors citizens?'

"The question puzzled me. Then I discovered that he had been reading statistics about the large number of professional and business men who have been slackers when it comes to taking part in political affairs and voting. Of course, my friend was trying to rib me. But, there is enough truth to his question to make physicians sit up and take notice.

"Apparently some people are not altogether sure of the answer to the question: 'Are doctors citizens?' Some political sources are trying to make the people think that the doctor is different from other citizens; that he has a different sort of civic obligation and a different sort of individual rights. Isn't it about time for the physician to stand up and be counted; to stand up and let the public know that he is a citizen and like other citizens has civic obligations and responsibilities?

"The Congressional elections on November 7 — in fact, the political campaigns which are now under way — will give the people of Ohio a good yardstick with which to measure the citizenship of the medical profession of Ohio.

"Is it a citizenship that influences government; a citizenship that is informed about candidates and political issues; a citizenship that means registration, working for able candidates, and voting? Or is it a negative and passive citizenship? Are doctors 'too busy' to fight for their citizenship, for the preservation of medical standards; for their professional freedom?

"The answer is up to you, Doctor. The testing time is here. It is time for doctors to prove that they are patriotic citizens, fully cognizant of their civic obligations and determined to live up to their great responsibilities." Enough Said. *Excerpt: Ohio State Medical Journal, July 1950.*

NEWS OF THE STATE

CHAMPAIGN

Personal.—Dr. Clarence Walter recently became anesthesiologist at the Carle Memorial Hospital and clinic, Urbana.

COOK

Personal.—Recent honors awarded to Dr. Max Thorek include the following: honorary fellow, Medical Society of Vienna, Austria; fellow of the Royal Society of Medicine, England; fellow, University of Buenos Aires, Argentina; honorary fellow of the Surgical Society, Sao Paulo, Brazil; honorary fellow, Surgical Society, University of Padua, Italy; and honorary member of the National Academy of Sciences, Mexico.

University News.—Two new appointments have been made to the faculty of the Chicago Medical School it was announced recently. Russell O. Hanson, Ph.D., has been appointed instructor in pharmacology and physiology. Dr. Hanson is a graduate of the Illinois Institute of Technology and the University of Wisconsin. Dr. Gordon Cherwitz has been appointed full-time instructor in pediatrics. Dr. Cherwitz graduated at the Creighton University School of Medicine, Omaha.

Name Medical Director of Heart Group.—Appointment of Dr. Hugh McCulloch as Medical Director of the Chicago Heart Association was announced recently by Dr. G. K. Fenn, president of the Association. Dr. McCulloch has been associated with the Chicago Heart Association as Medical Director of its Council on Rheumatic Fever since January 1949.

Dr. McCulloch was one of the founders of the American Heart Association in 1922, and is a member at present of its Board of Directors and Executive Committee. He is the editor of *Pediatrics,* the journal of the American Pediatric Association, and is a nationally prominent authority in the field of rheumatic fever and rheumatic heart disease. He is a member of the Arthritis and Rheumatism Foundation and of the Technical Advisory Committee on Rheumatic Fever of the United States Children's Bureau.

An expanded program of research, community service and medical and lay education will be headed by Dr. McCulloch, with a medical advisory group of the Chicago Heart Association.

Lecture Series on Blood.—The annual fall lecture series began at the Chicago Medical School, October 11, and will be held throughout November 29 at 12:30 p.m. in Amphitheatre A. The lectures will be on the subject of Blood, with the final program given over to a display of the various medical and scientific exhibits prepared by members of the faculty. The schedule is as follows: October 11, Dr. William Bloom, professor of anatomy, University of Chicago School of Medicine, "The Genesis of the Blood Cells"; October 18, Dr. Carl Moore, professor of medicine, Washington University School of Medicine, St. Louis, "Iron Metabolism and the Iron Deficiency Anemias"; November 1, Dr. Robert W. Heinle, associate professor of medicine, Western Reserve University, Cleveland, "The Anti-Pernicious Anemia Substances"; November 8, Dr. S. C. Wang, associate professor of physiology, Columbia University College of Physicians and Surgeons, "Shock"; November 15, Dr. I. Davidsohn, professor and head of the department of pathology, Chicago Medical School, "The Serologic Aspects

of the Rh Factor"; and November 29, Exhibits, Faculty of the Chicago Medical School.

Promotions At Illinois.—Promotion of Drs. Carroll L. Birch, Ford K. Hick, Paul H. Holinger, L. J. Meduna, and Klaus R. Unna from the rank of associate professor to full professor in the University of Illinois College of Medicine has been announced by Dean Stanley W. Olson.

Dr. Birch, a member of the faculty of the Department of Medicine since 1926, has specialized in blood diseases and tropical medicine. She spent six months in England and other European countries in 1936 for the study of hemophilia, and six months in Africa last year for the study of African Sleeping Sickness and other tropical diseases. She holds doctor of medicine and master of science degrees from the University of Illinois.

Dr. Hick, an internist, has been a member of the UI faculty since 1931. He served in the U. S. Army as a medical officer for five years during the war. His principal research interests have concerned the reaction of circulation to different environmental temperatures. He holds doctor of medicine and doctor of philosophy degrees from the University of Illinois.

Dr. Holinger's work has been in the fields of bronchoesophagology and laryngeal surgery. He has developed techniques for photographing the air and food passages which have received international recognition. Dr. Holinger has served as president and secretary of the American Bronchoesophagological Association and as secretary-treasurer of the American College of Chest Physicians. He has been a member of the UI faculty since 1933, when he was appointed a resident in otolaryngology. He is a graduate of Northwestern University.

Dr. Meduna has gained recognition for his research contributions in psychiatry, especially the development of metrazol shock treatment which is regarded as the foundation for shock therapies in mental disease. Dr. Meduna has been an associate professor of psychiatry since he joined the UI faculty in 1943. He is the author of two books published this year, "Carbon Dioxide Therapy" and "Oneirophrenia." He received the doctor of medicine degree from the University of Sciences, Petrus Pazman, at Budapest, Hungary.

Dr. Unna has made notable contributions in the fields of the curare-like alkaloids, pharmacology of vitamins, intravenous ammo acid therapy, and construction of new pharmacological equipment. Dr. Unna joined the faculty in 1945 as an assistant professor of pharmacology, and since that time has devoted his research efforts largely to the field of curariform drugs and other muscle relaxants. He received the M.D. degree at the University of Freiburg, Germany, in 1930.

Virus Laboratory Established.—A Virus Laboratory unit has been established at the University of Illinois College of Medicine for the purpose of training virologists and maintaining a full program of research.

Several investigations already have been undertaken, with the support of the U. S. Public Health Service, the University's Graduate College, and Eli Lilly and Company, Indianapolis, Ind.

Current research studies involve influenza and mumps. Under the direction of Dr. John E. Kempf, an investigation is being conducted to study the virus etiology of certain skin diseases by the use of the electron microscope.

With the establishment of the Virus Laboratory unit, the Department of Bacteriology plans to take a major position in the training of virologists for the anticipated demands for teachers and research workers.

Grants for Research.—Three research studies in aviation medicine will be undertaken this fall by the University of Illinois College of Medicine for the U. S. School of Aviation Medicine at Randolph Field, Tex.

The Air Force has awarded grants in the total amount of $38,705 to the University for the studies.

Dr. A. C. Ivy has received a $17,200 grant in support of research studies on the mechanism and effects of aeroembolism.

An investigation to determine the effects of altitude stress in subjects with impaired cardiorespiratory function will be undertaken by Dr. Robert W. Keeton. He will receive $14,375 for the study.

A study of the effect of altitude on intra-abdominal lesions will be conducted under the supervision of Dr. Warren H. Cole. The grant for this research amounts to $7,130.

Three Chicago firms have awarded grants totaling $8,900 in support of research studies. The grants are as follows:

Armour and Company, $3,600, in support of an investigation of the eosinophile producing factor in the liver to be conducted by Dr. Robert M. Kark.

Consolidated Cosmetics, Chicago, $3,300, in support of a study of the mode of action of a substance used to destroy hair. This investigation is being directed by Dr. Adolph Rostenberg, Jr., in the Department of Dermatology.

Abbott Laboratories, $2,000, representing a renewal of a grant in support of the study of dietary therapy in liver disease. This investigation also is being conducted by Dr. Kark.

Research in Heart Disease.—The Chicago Heart Association announced September 5 the award of ten financial grants totaling $110,363 for research in heart disease. The Rheumatic Fever Research Institute of Northwestern University got a $25,000 grant. La Rabida Sanitarium received $24,416, and Dr. Albert Dorfman, University of Chicago School of Medicine, received $21,800 for research in conjunction with studies at La Rabida. Other grants and the amounts include $9,425 to Dr. George F. Simmons, Stritch School of Medicine of Loyola; $5,000 each to Dr. Arthur J. Gatz of Loyola and Dr.

George E. Wakerlin, University of Illinois College of Medicine; $6,490 to Michael Reese Hospital; $8,956 to Herrick House; $2,450 to Dr. Tilden C. Everson, University of Illinois; and $2,000 to Dr. Albert Milzer and Dr. Kate Kohn of Michael Reese Hospital.

Mercy Hospital Installs New X-Ray Machine.—An x-ray machine containing one million electron volts, said to be the first of the kind in the city, will be installed at Mercy Hospital Institute of Radiation Therapy under the directionship of Dr. Herbert E. Schmitz, it was recently announced. Dr. Schmitz is professor and chairman of the department of obstetrics and gynecology at Stritch School of Medicine of Loyola University, and head of the department of obstetrics and gynecology at Mercy Hospital. Engineers from the Chicago office of the General Electric X-Ray Corporation will install the unit.

According to Dr. Schmitz, the 800,000 volt machine has proven the value of supervoltage x-ray particularly in malignant conditions of the ovary, endometrial uterine tissue, cervix, breast and larynx. A report of the Institute, recently presented to the American Radium Society, showed a 43% five-year survival of patients with cancer of the cervix treated with 800,000 volt x-ray plus radium.

The new 1,000,000 volt machine will supplant an 800,000 volt unit which was the first x-ray machine in the "super-voltage" class ever to be installed. This took place in 1933, at a time when the use of supervoltage was in the pioneering stage.

The new million-volt unit will be the 13th medical million volt x-ray treatment machine in the world, and is similar in principle to apparatus of the same voltage now widely used to inspect castings, forgings and welds in industrial plants.

Annual Public Relations Day Meeting.—The Woman's Auxiliary to the Chicago Medical Society will hold an Annual Public Relations Day meeting, October 24, at the Blackstone Hotel. The speakers will include the following: Mr. Everett M. Dirksen, attorney and Republican Candidate for senator in Illinois; Mr. John W. Neal, general counsel, Illinois State Medical Society; and Dr. Warren W. Furey, past president, Chicago Medical Society, who will discuss various aspects of "Medicine in Public Affairs." Dr. Morris Fishbein will act as moderator.

HANCOCK

Eighty-Nine Years of Age.—Dr. A. C. Runyon, Carthage, celebrated his eighty-ninth birthday August 6. He is still engaged in the active practice of medicine. He launched his practice in Ferris, March 1, 1884, later went to Elvaston, and for the past three years has been practicing in Carthage.

SANGAMON

Society News.—Dr. Herbert C. Landis, professor of urology, Stritch School of Medicine of Loyola University, addressed the Sangamon County Medical Society, September 7, on "Diagnosis and Treatment of Vesical Orifice Obstruction".

SHELBY

Society Endorses Health Unit.—The Shelby County Medical Society announced to the press recently that it does not favor the discontinuation of the Shelby county branch of the Shelby-Effingham health department.

WABASH

Health Officer Resigns.—Dr. Dale E. Scholz has resigned as health director of the Lawrence-Wabash county health department, effective September 1.

WOODFORD

Dr. Morrison Honored.—An open house marked the seventieth birthday and the anniversary of forty-five years of practice of medicine for Dr. Winfield Morrison recently. Dr. Morrison is the oldest practicing physician of Minonk. He was secretary of the Woodford County Medical Society for fifteen years, secretary of the grade school board for twelve years, county coroner for four years, a member of the County Sanatorium Board, and physician for the Illinois Central Railroad for twenty-five years.

GENERAL

Society News.—Dr. Fremont A. Chandler, Chicago, Illinois, was chosen president-elect of the American Orthopedic Association recently and Dr. C. Howard Hatcher, Chicago, a member of the research committee.

Heart Association Officers.—The following physicians were recently elected as officers of the Illinois Heart Association: Dr. Edward W. Cannady, East St. Louis, president; Dr. Frank Deneen, Bloomington, vice president; and Dr. Robert W. Elliott, Alton, secretary. The physicians elected to membership of the Board of Directors include Drs. V. T. Austin, Urbana; Noland White, Centralia; John P. Doenges, Olney; Stanley L. Levin, Danville; Preston W. Sawyer, Kankakee; Thomas A. Starkey, Beardstown; B. T. Siegel, East St. Louis.

Boston Clinical Congress Announced by American College of Surgeons.—Dr. Paul R. Hawley, Director of the American College of Surgeons, announces that color television, clinics, postgraduate courses, forums, symposia, panel discussions, official meetings, films, hospital conferences and exhibits will vie for the attention of the several thousand surgeons and hospital representatives who will attend the thirty-sixth Clinical Congress of the College in Boston, October 23 to 27. Headquarters will be at the Hotel Statler. Meetings will be held there and at the Copley-Plaza Hotel, Mechanics Hall, Symphony Hall, and the New England Mutual Hall. Dr. Thomas H. Lanman is chairman of the Boston Committee on Arrangements.

The national emergency will affect the character of the discussions at many of the sessions, and every effort is being made to have the Clinical Congress contribute its share to promoting the medical aspects

of civilian defense and of care of the military forces, according to Dr. Hawley.

A new and exceptionally interesting feature of the program will be the holding of a series of post-graduate courses from Monday through Friday mornings at the Boston City, Peter Bent Brigham, Children's Massachusetts General, and Massachusetts Memorial hospitals. The subjects, to be presented at each hospital on different days, will be as follows: Nutrition, Vascular Diseases, Fractures of the Skull and Spine, Fractures of the Long Bones, and Pre- and Postoperative care.

Twenty-five Boston and vicinity hospitals will conduct clinics for the visiting surgeons every morning and afternoon during the Congress. Surgical procedures at Massachusetts General Hospital will be televised in color to Mechanics Hall every morning except Monday and every afternoon except Friday. Smith, Kline and French Laboratories of Philadelphia will furnish the television.

Thirteen Forums on Fundamental Surgical Problems in which the latest research findings will be presented, mainly by the younger surgeons, will be held Monday through Friday.

Symposia on Sports Injuries, Cancer, Trauma, and Graduate Training in Surgery, are planned — also a Clinico-pathological Conference.

Tuesday, Wednesday, and Thursday evenings, October 24-26, will be devoted to scientific sessions in general surgery, ophthalmology, and otorhinolarpngology. Afternoon panel discussions will also be held in these fields. On Friday afternoon there will be six surgical specialty panel discussions.

Conferences for hospital personnel will be held throughout the week under the direction of Dr. Malcolm T. MacEachern, Director Emeritus of the College.

Dr. Arthur W. Allen of Boston is chairman of the Board of Regents of the American College of Surgeons, which has a fellowship of 16,500 surgeons in the United States, Canada and other countries. The President is Dr. Frederick A. Coller of Ann Arbor. The President-elect, who will be installed at the Presidential Meeting on Monday evening, October 23, is Dr. Henry W. Cave of New York. The subject of Dr. Coller's Presidential Address will be "For the Benefit of the Patients."

Several hundred initiates will be received into fellowship at the Convocation on the final evening, Friday, when the Fellowship Address will be given by the Director, Dr. Hawley, whose subject will be "Quo Vadimus?"

Other main addresses will be the Fifth Martin Memorial Lecture at the Presidential Meeting by Professor Sir Geoffrey Jefferson of Manchester, England, on the subject, "The Balance of Life and Death in Intracranial Lesions," and the Fracture Oration on Wednesday evening by Dr. J. Huber Wagner of Pittsburgh.

DEATHS

FRANCIS C. BECHT, Riverside, who graduated at Northwestern University Medical School in 1916, died September 14, aged 70, in MacNeal Memorial Hospital, Berwyn, of which he was one of the founders.

JESSE W. CARR, LaGrange, who graduated at Hering Medical College, Chicago, in 1895, died August 18, aged 82, while visiting in California. He was a former president of the La Grange Board of Health.

FRED MILLER DRENNAN, River Forest, who graduated at Rush Medical College in 1913, died August 26, aged 66. He was clinical professor of medicine at Loyola University School of Medicine.

CHARLES E. EISELE, East St. Louis, who graduated at St. Louis College of Physicians and Surgeons in 1905, died August 28, aged 68. He was a member of the staffs of St. Mary's and Christian Welfare Hospital; he was president of the Southern Illinois Medical Association, and the St. Clair County Medical Society.

EDWARD F. GOLLOBITH, Hanover, who graduated at the University of Illinois College of Medicine in 1908, died August 16, aged 66, while visiting in Minnesota.

MAURICE B. JACOBS, Chicago, who graduated at the University of Illinois College of Medicine in 1935, died August 28, aged 39. He was a member of the Chicago Pathological Society.

ROY L. KENWARD, MELVIN, who graduated at the University of Illinois College of Medicine in 1932, died August 24, aged 43. He was on the staff of the Paxton Clinic.

MILTON MANDEL, Chicago, who graduated at Northwestern University Medical School in 1904, died August 28, aged 69. He was senior attending physician of Mercy Hospital and professor of clinical medicine at Loyola University School of Medicine.

GEORGE H. MUSSELMAN, retired, Galesburg, who graduated at the University of Illinois College of Medicine in 1909, died August 22, aged 67. He had practiced medicine in Winnetka before moving to Galesburg.

EDWARD PAPIK, Chicago, who graduated at Bennett Medical College, Chicago, in 1908, died August 20, aged 70.

WILLIAW F. PETERSEN, Chicago, who graduated at Rush Medical College in 1912, died August 20, aged 63. He was director of the Department of Clinical Research at St. Luke's Hospital.

ROBERT AARON, REEDY, Rockford, who graduated at the Chicago College of Medicine and Surgery in 1909, died June 25, aged 71, of uremia and hypostatic pneumonia.

VASILI V. SUNTZEFF, Quincy, who graduated at Northwestern University Medical School in 1938, died August 26, aged 55.

PAUL E. THAL, Zion, who graduated at Chicago Medical School in 1922, died August 16, aged 63. He had practiced medicine in Chicago for 35 years.

HENRI H. WEATHERS, East St. Louis, who graduated at Meharry Medical College in 1927, died August 2, aged 47.

"FOR THE COMMON GOOD"

Health Talk on WGN-TV.—Since the last Illinois Medical Journal, the following telecasts have been presented over WGN-TV under the auspices of the Educational Committee:

Your Child Goes to School, August 21, Paul K. Anthony and Kenneth Nolan.

Your Sinuses, September 11, Raymond W. Kerwin. Civilian Defense, September 18, Sidney O. Levinson, Benjamin Boshes, Walter C. Bornemier, Mr. Robert Carnahan and Janet Sprickman of the American Red Cross, Mr. Robert Murrill U. S. Public Health Service, and Mr. Benn Leland, Cook County Department of Public Health.

Your Doctor Speaks over WFJL, Thursday evenings, at 7:15, carried the following transcribed broadcasts: Robert T. Stormont, September 21, Chemistry and Medicine. Edwin Leving, September 28, on Tuberculosis. George V. LeRoy, October 5, Liver Disease. James H. Hutton, October 12, The Menopause.

You and Your Baby over Station WAAF, Tuesday mornings at 10:30 a.m. presented the following physicians in live broadcasts. H. William Elghammer, August 29, The Second and Third Month of Life. George L. Drennan, Jacksonville, September 5, Immunization. Morley D. McNeal, September 12, A Mother's Love. L. Martin Hardy, September 19, Questions Parents Ask.

Here is Your Doctor Over Station WCFL, Sundays, at 11:45 a.m., carried the following physicians in transcribed broadcasts; Joseph N. Rappaport, Evanston, August 27-29, Importance of Preschool Examinations. George Cummins, September 3, on Stomach Ulcers. George A. Hellmuts, September 10, Understanding the Heart. Peter Rosi, September 17, Surgical Treatment of Peptic Ulcer. Herbert Nash, October 1, Sinusitis.

Dr. James P. Shortall, medical director of the Chicago Federation of Labor, appears as moderator in Here is Your Doctor; as-does Mr. Frank McGivern, publicity director, WCFL, is the announcer.

Lectures Arranged Through the Educational Committee of the Illinois State Medical Society:

Adrian Kraus, November 14, Hubbard PTA, in Chicago, Common Diseases of Childhood.

Vernon de Young, November 20, Woodfield Woman's Club, on Keeping Children Happy.

Eugene L. Slotkowski, November 20, Emotional Need of the Grade School Child.

Reuben C. Pearlman, Gage Park Woman's Club, November 28, on Plastic Surgery Today, illustrated.

Lectures Arranged by the Scientific Service Committee of the Illinois State Medical Society.

Irving Steck, Chicago, Effingham County Medical Society in Effingham, September 14, on Diagnosis and Treatment of Arthritis, illustrated.

Ormand C. Julian, and George Holmes, both of Chicago, before the Will-Gundy County Medical Society in Joliet, September 26, on Arterial Vascular Diseases of Lower Extremities and Surgery of Pulmonary Tuberculosis, respectively; both addresses were illustrated.

Fred O. Priest, Chicago, Bureau County Medical Society in Prenceton, October 10, on Bleeding During Pregnancy.

Paul F. Fox, La Salle County Medical Society in La Salle, November 9, on Pre and Postoperative Therapy, illustrated.

Richard B. Capps, Chicago, Whiteside and Lee County Medical Societies, in Rock Falls, November 9, on Diagnosis and Treatment of Heptatitis and Its Importance in Medicine and Surgery, illustrated.

Morris T. Friedell and Louis R. Limarzi, both of Chicago, Will-Grundy County Medical Society in Joliet, November 14, on Radioactive Iodine in Treatment of Thyroid Diseases and Treatment of Blood Dyscrasias, respectively; both addresses will be illustrated.

Theodore R. Hudson, Chicago, Kankakee County Medical Society in Kankakee, November 21, on Some Diagnostic Problems in Pulmonary Disease, illustrated.

Eugene T. McEnery, Iroquois County Medical Society, November 21, in Watseka, Asphyxia of the Newborn.

Mr. John Neal, Counsel, Illinois State Medical Society, McDonough County Medical Society, November 24, in Macomb, on Medical Legal Aspects of Personal Injury Cases.

Leonard M. Schuman, Springfield, Macoupin-Montgomery County Medical Societies, November 28, in Carlinville, on Poliomyelitis.